COAL AGE

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The Christmas Message

Peace on earth, good will toward men

WHERE? An American schoolboy can answer that. Here in America, but not on the other side of the ocean.

Just around the corner from our office is a politician orating on the subject of preparedness. (Everybody is doing it or will be doing it before Congress adjourns in the Spring.) And what is he saying? Well, among other things he is saying that our mine workers and our mine owners must be made to pull together before it is too late if we would profit by the mistakes of our brothers across the water.

Some day we may have to mobilize our mines and our mills as well as our army, and then we shall have to appeal to the patriotism of all. The English have found that such patriotism cannot always be taken as a matter of course. Since the orator is only a politician, he can't be expected to express himself too clearly, but somehow we don't have trouble to understand such words as mobilize and preparedness, which he repeats again and again. It seems as if they had always had a place in our everyday vocabulary, peace loving though we are.

It's all very well to deplore the fact that civilization seems to have gone to pieces on the other side of the ocean, but while we are doing that, prudence suggests that we do not close our eyes to everything that is going on around us. It hasn't been so long since we considered Europe as on a permanent peace footing.

Peace on earth, good will toward men

HERE is a labor organization whose leaders are crying, "Down with the state militia—we will have nothing to do with it." Where are they going to lead us?

Here is an operator who is demanding that he be left to follow the dictates of his own conscience in dealing with his men. His forefathers dealt with the Indians, guided by their conscience only.

And here is a lawmaker who proposes a law to make it illegal for corporations to employ guards for their properties in times of mob reign, nor does he realize that he is taking sides in a conflict. Again, here is a community clamoring for pardons to be given a veritable army of murderers because punishment or confinement will not cure crime.

How easy it is to get in tune with the spirit of strife.

Perhaps after all we too may profit by the Christmas message, and in spite of all our presumptions to the contrary would present but a sorry spectacle should we attempt to sit in judgment upon the civilization across the seas.

Peace on earth, good will toward men

No, we have not outgrown the need of such a Christmas message, we men of the mines.

Ideas and Suggestions

Cashing In One's Experience

How many of you mining men make it a rule to profit only by your own experience in the mining game?

Several years ago most of you would have answered like the man at the altar about to be married. We had not then progressed to the point where the other fellow's experiences are almost as freely at our disposal as our own. We were not as used then as we are now to trade journals containing the cream of interchangeable ideas and experiences.

But with all the means at our disposal, how many of us continue to cash in only our own experiences and how few are willing to accept gratis a few shares of the other fellow's stock, which would enable us to draw dividends from his investment?

Experience is often another definition for mistakes. The man who is a failure is the one who has blundered and is not able to cash his experience. The trouble in the coal-mining business is that it takes too many mistakes to produce an adequate supply of experience, and after all there is no reason why a man's supply need be acquired in this way.

Coal Age is constantly trying to present interestingly facts and experiences of the mining game which will benefit its readers. Every good suggestion on the Foreword page or elsewhere is born of some experience. Some blunder was made and the forfeit paid; then came the remedial idea, and the result of its application is given to the workers all along the line.

Eliminating Idle Hands

Do you want to run your plant with only as many men as are necessary for its safe operation? Of course you do, and you believe you are until careful scrutiny shows up a man who could be dispensed with. You don't want it to happen again, do you? Of course not. Then look through your trade-journal files. You'll be almost sure to find a good scheme of daily quota sheets which will help you to avoid it in future.

You don't want straw men on your roll? You hardly see how they could get there, do you? But you read about it every now and then in companies whose payroll plan is about like your own. Many suggestions and definite plans have been noted regarding this. Better look back through your files and avail yourself of systems employed by concerns that have encountered this same trouble. It may save you the cashing in of a very expensive experience.

Do you want to know how to keep an adequate stock of mine supplies without tying up too much money? You'll find many a good suggestion you can utilize to help accomplish this, such as the right kind of stock sheets, classification, etc.

Do you want "safety first," and do you want to work out policies of welfare and all that kind of thing for the benefit of your employees? You can have it in large measure simply by reading what the other fellow has found best. You can work your policies out the same way at no extra cost for his experience.

I know a man whose plan of making subscriptions for trade journals pay is to take each issue and index the best suggestions of any kind. He puts them in effect and makes a record of the result in actual money saving. At the end of the year the price of the subscription has been returned manyfold.

Don't permit yourself to believe that you can't realize on the other fellow's experience. All you've got to do is to get busy and do it.

Just Plain Horse Sense

Nearly everybody has some idea that horsepower is a standard for estimating the power of steam engines.

Horse sense may be defined as a standard for measuring the power of men's minds as applied to practical things. It is a quality of mind for which executives are always looking, and for which they are willing to pay a good price.

Recently when visiting another man's plant (a big one too) I ran across a horse-sense man.

His company had successfully weathered two dull years. A look through the supply house showed what seemed to be an abnormally low stock for an operation of that size. My first thought was that the recent hard times were responsible for the small quantity of supplies, but a remark concerning this matter struck home, and the "milk in the cocoanut" was revealed.

"No, sir," the official in question replied, "we don't let our people order stuff we can get along without. We don't countenance waste, and we can't afford to tie up cash in surplus stores."

Then he told me a little story. Taken out of his mouth and told in my own way, it ran like this:

"Passing through our machine shop one day I saw a barrel full of waste material. My master mechanic said it was old junk, packing, etc., that was no good. I said nothing then, but that night I went down and emptied the barrel. It was nearly full of packing, which I carried to the storeroom. Taking the packing of similar sizes out of new boxes in stock, I substituted the old and hid the new. Later my master mechanic used it all without a word, and I never told him what I had done until the right time. Now he knows how to use packing."

It was a clean-cut case of plain horse sense, and in my mind I had to hand it to the superintendent (for it was he) who showed me around.

I thought of supply houses I had seen at other mines where stock was carried far in excess of requirements and especially of one place where the surplus packing spoiled through deterioration and was utterly lost.

There is a moral: Plain horse sense practically applied always pays.

Have you a horse-sense man? Pay him well and keep him with you. If you haven't such a man, look about and find one soon.

A Man's Courage

By William Jardine*

Courage in man is a subtle quality, and its expressions are as varied as human nature itself. To the mining man it is a necessity, and its possession frequently means success.

There is the silent, intelligent courage of the "plodder" and the bold, reckless courage of the "hustler."

A man without this quality, if employed at the head of an operating concern, is miserably lost.

He ceases to be a "live wire." Have you noticed the other fellow get promotion and wondered why he got it? Did you go out and congratulate him, or did you stay back and say to yourself, "It is I that should have been promoted?"

Are you responsible for your position as a worker? Have you the necessary Twentieth Century push? Examine yourself and determine how to act. *Act today.* We desire to better our position, and the number of attempts to accomplish those desires bear adequate testimony to unflinching courage.

Work in earnest, combine dignity and interest with your work, and you will "get there." Above all, "have the courage of your convictions."

Taking a Chance

By George N. Lantz†

The mine where I am employed has been running on short time, and on idle days only a few men are on the job—the mine-boss, the engineer, the blacksmith, the pumper, the stable-boss and myself.

Yesterday the engineer, as he frequently does, asked me to go to the hoppers for boiler coal. I took the motor and backed the empty trip to the hoppers. I backed into the loaded cars on the hoppers very carefully, but they started to move slowly, and before I could get to them from the motor, the end of the trip had run through the hopper wall. Result—two broken cars, two twisted rails, repairs on the return switch and a loaded car off the track, while the coal from the two wrecked cars had to be hauled by wagons and loaded on mine cars.

The accident might have been prevented in any one of these three ways: I could have taken someone along to couple the loads to the empty trip, but the blacksmith was busy, the engineer could not leave his engine and both the mine-boss and stable-boss were out of sight. I could have switched the empty trip and taken a light motor. I could have stopped the trip before I reached the loaded cars until I had assured myself that enough brakes were set to hold the trip. Instead of doing this, however, I "took a chance."

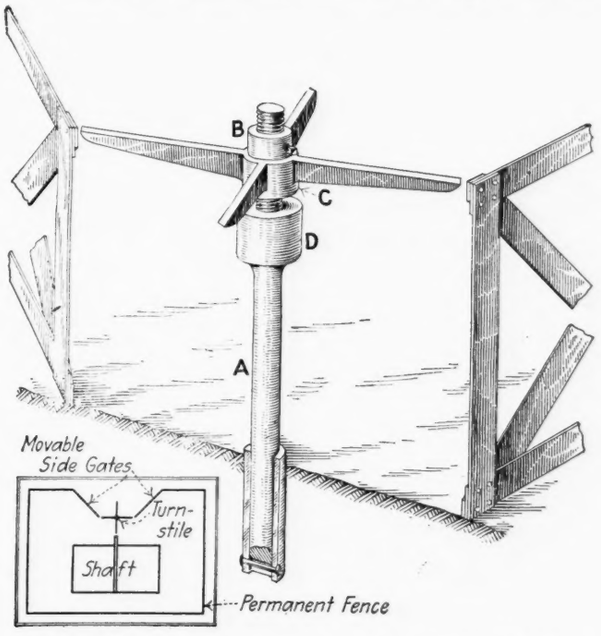
I relate this incident because it is a rather impressive lesson in the need of "safety first" at all times and not spasmodically. I have consistently advocated "safety first," and as a rule I practice what I preach. And this one violation of a self-imposed rule of conduct will not prevent me from continuing to preach and to practice the "safety first" rule.

The "safety first" movement is gaining ground. The cautious man is coming in for the same sort of admiring approval that the reckless man claimed a few years ago. We frequently hear the question, "Which way is the safest?" when miners are undecided on a plan to take in doing their work, and often the easiest or the quickest way is discarded in favor of the safest way. The old rule of "take a chance" is being supplanted by " safety first."

*No. 4 mine, Bunsen Coal Co., Universal, Ind.
†New Straitsville, Ohio.

A Simple Shaft Gate

The shaft gate illustrated herewith is used at the colliery of Jermyn & Co., at Rendham, Penn. Its purpose is to limit the number of men who can get on the cage at one time. The post *A*, which may be a piece of old shafting, is slotted at the bottom and threaded at the top. The four-armed turnstile *C* screws up and down



DETAILS OF A SAFE AND PRACTICAL SHAFT GATE

on this post. Its motion is limited by the collar *B*, which can be fixed in any position by the setscrews.

As used at Rendham, the stile makes 2½ turns, this allowing 10 men to pass to one side of the shaft. When this number has passed, the stile is turned in the other direction by the men passing into the other cage.

When the shaft is being used for coal or supplies, the gate is lifted out of the socket and set aside. The side gates are light enough to be easily handled by one man. These are lifted out of the way when not in use. This arrangement, devised by Superintendent Corcoran, prevents men from crowding onto the cages in larger numbers than would be safe or allowable by law.

How many thousands of coal-mine employees are at their jobs just to see "how much they can get out of it" rather than to determine "how much they can put into their work"!

There are many people who do not sympathize with the cry of "over-production." They attribute the "high cost of living" to under-production per human unit and contend that under-production is the direct cause of under-consumption through lack of capacity to purchase.

Compressed Air in Construction and Repair Work

By Charles C. Phelps*

SYNOPSIS—For certain kinds of work compressed air is preëminently adapted. It is also often desirable to take the tools to the work rather than to bring the work to the shop. In such instances the portable motor-driven air compressor may be used to advantage.

In connection with construction and repair work both above and under ground there are many operations that can be performed much more economically and expeditiously with the assistance of compressed air than by any other known means. In many instances it might not be advisable to construct a stationary compressor plant or to pipe air from an existing plant located at a distance, owing to the temporary character of the work.

The average uptodate coal-mining property is equipped with an electric transmission system, and under these circumstances, one of the most convenient means of obtaining compressed air for use in construction and repair work is by employing electric motor-driven portable compressors. Truly successful apparatus of this type is of comparatively recent development, and it is the intention to discuss in this article only the various types of electrically driven outfits and their uses. It should be borne in mind, however, that corresponding machines driven by other prime movers, such as gasoline, oil or steam engines, are sometimes better adapted to existing conditions and, as a matter of fact, are in extensive employment.

Construction that must be prosecuted at one time or another outside of the coal mine usually involves rock cuts and the removal of boulders in connection with grading for tracks or roads, digging trenches and pits, removing old concrete and masonry construction and the like. For these purposes Jackhamers, operated by compressed air, are highly economical, drilling from 100 to 200 ft. of hole per shift, whereas one-tenth of this footage could not be obtained in all probability in the same time by hand.

In building concrete foundations, culverts, bridges, dams, sluices, buildings, etc., pneumatic concrete rammers are often used to advantage. A Belgian engineer who made a study of this subject found that the number of blows struck played a far more important part in compacting the concrete than the force of the blow. It follows that the pneumatic rammer, which strikes approximately 600 light blows per minute, is ideal in comparison with hand ramming in which the maximum speed obtained is 50 or 60 blows per minute. This conclusion is verified by a test made with small cubes in which 60 blows left the concrete with a resistance of 2,844½ lb. per sq.in., 40 blows with 2,460¾ lb. and 20 blows with 1,538 lb. A similar test with hand ramming gave a resistance of only 939 lb. per sq.in. The hand rammer used weighed 33 lb. and was permitted to fall from a height of 20 in.

It is apparent that by obtaining a stronger product by tamping, a lighter structure will often serve the purpose, saving considerably in cost of materials and workmanship. Pneumatic tampers of a different type are being adopted extensively for tamping railroad ballast.

In the construction of steel or wooden bridges or trestles, laying tracks and erecting steel or wooden structures of various kinds, pneumatic tools are invaluable. Pneumatic drills, are used for drilling metal, boring wood, reaming, tapping, operating jacks, cranes, hoists and grinding wheels and small circular saws. They are also of great advantage for running in lag screws and tightening nuts. In one case a gang of seven men put up from 80 to 100 hangers in 9 hr., each supported by two ¾-in. lag screws. The holes were bored with pneumatic augers using ⅝-in. bits, later driving the screws home by means of the same motors used with extension sockets. This is at least double the work that could be performed under similar conditions by using augers and wrenches operated by hand.

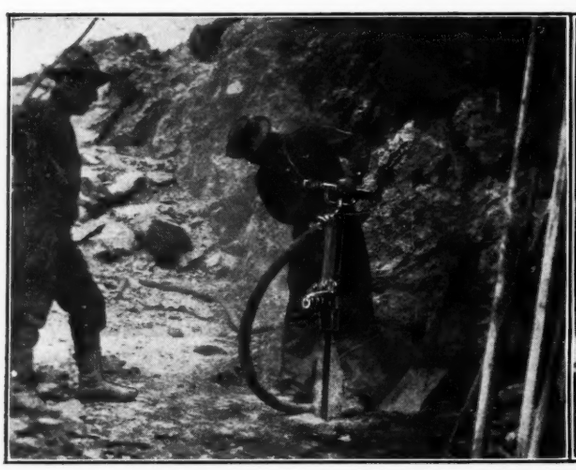


FIG. 1. MAKING A ROCK CUT WITH JACKHAMERS

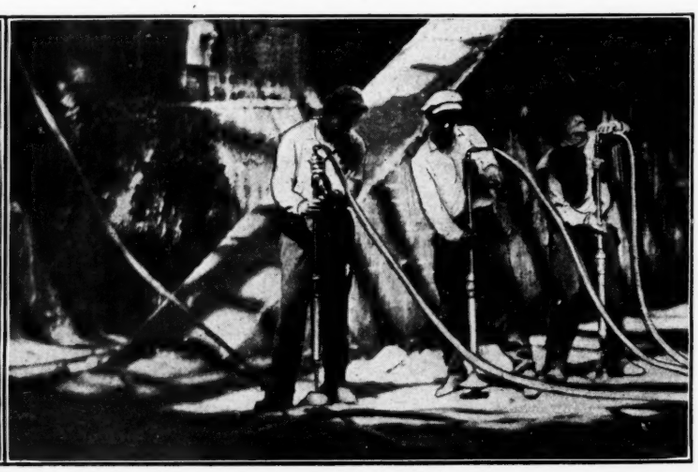


FIG. 2. PNEUMATIC CONCRETE RAMMERS IN OPERATION

*New York City.

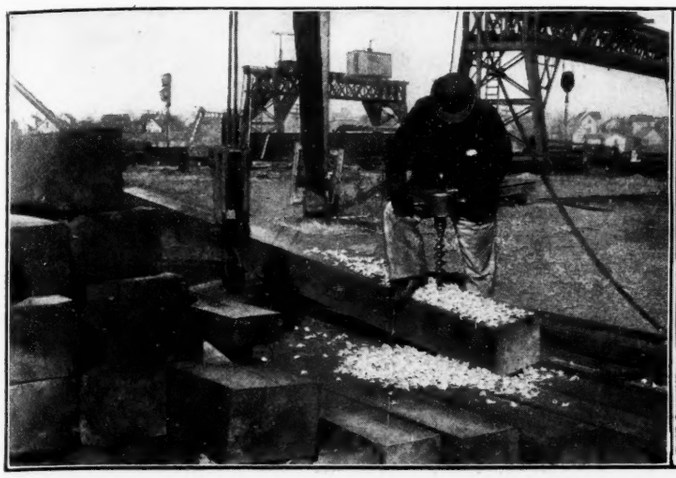


FIG. 3. A PNEUMATIC AUGER IN OPERATION

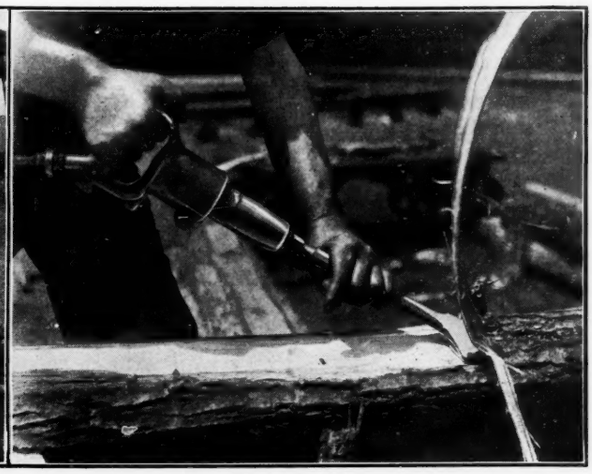


FIG. 4. CHIPPING HAMMER USED FOR TIE PEELING

There is no comparison to be made between pneumatic riveting hammers and hand methods for heading rivets. Compressed air is also convenient for blowing rivet-heating forges. Riveters can be fitted with a handy rivet "busting" attachment and have been adapted to driving spikes. In one case they were used for driving 9-in. spikes at the remarkable rate of 5 sec. each. On the same job a number of 7/8-in. bolts 38 in. long were each driven by compressed air in 1 min. as against 18 min. by hand.

Pneumatic chipping hammers are invaluable for trimming, cutting and calking metal and may be fitted with a special chisel for such work as peeling the bark from logs in preparing ties or props. This last is a new application of this tool which is capable of great savings. It is said that the most expert tie peeler is capable of peeling by hand an average of 100 ties per day of 10 hr., but the average output is nearer 50 ties per day. Experiments have shown that an inexperienced laborer has no difficulty in thoroughly peeling from 150 to 200 ties per day with the tool illustrated in Fig. 4. These tools do not consume much air, but even with this expense added, there is a large saving over the old method.

In connection with repair work the opportunities for using pneumatic appliances are almost without number, for it is in this class of work particularly that it is often desirable to take the tool to the part to be repaired instead of taking the part to the shop. The greatest savings effected with portable pneumatic tools often pertain to the avoidance of costly delays incident to some minor part giving way and affecting the operation of important machinery.

In addition to the applications outlined, pneumatic drills are used for grinding and reseating valves, for reboring cylinders and for operating large valves and small machines. Chipping hammers are used for quickly cutting out sections of pipes and sheet-metal work and for scaling rust and paint from metal surfaces. The cement gun, the sand-blast machine, pneumatic paint and whitewash spraying machines, pneumatic displacement pumps and air-operated reciprocating pumps are other devices of the greatest value in repair and construction work.

Many of the appliances mentioned also find everyday application about the shop and power plant. A few of these applications may be enumerated as follows: Setting locomotive valves; expanding boiler tubes and flues; cleaning scale from boiler tubes with the aid of pneumatic drill motors; beading tubes and calking sheet metal with chipping hammers; drilling anchor-bolt holes in concrete machinery foundations; blowing out the air spaces of electric motors, the flues of boilers and other inaccessible places by means of an air jet. Compressed air is also commonly used for testing the tightness of pipe lines. Air from a stationary compressor is not available in some of the smaller plants, and in such cases a portable unit might be used to advantage.

Having defined the field of the portable compressor in general, the various types will now be described briefly.

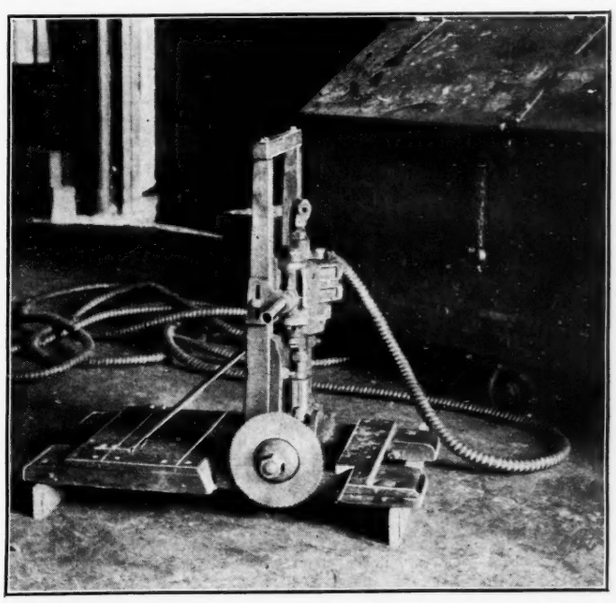


FIG. 5. PORTABLE SAW FOR CUTTING OUT OLD ROOFING OR FLOORING

The mine car compressor is the most suitable type for underground operations. During the past few months it has been adopted extensively for operating hand drills, mounted cutting machines, punchers, pneumatic tools, etc. After a brief try-out that demonstrated beyond doubt their economy, one Pennsylvania coal mine purchased 14 of these outfits, and many other mines in various parts of the country are starting to use them.

This equipment is a self-contained, self-lubricating, electrically operated unit, totally inclosed as a protection against the entry of dirt to the working parts. It can be started up by the miner and will run without further attention while he is drilling the coal or rock, excepting occasional replenishment of water in the reservoir cooling jacket surrounding the compressor cylinder. It may be quickly and easily moved over the regular mine tracks to any part of a mine and can be set up and connected with the regular mine power wires in a short space of time. This type of compressor is made in capacities ranging from 78 to 415 cu.ft. of free air per minute.

The mine car compressor is equally suitable for use above ground provided the work is situated within a few hundred feet of the tracks over which it runs. Fig. 6 illustrates a type that is perhaps better suited for general conditions above ground, as it can be transported by horse or other power to almost any location. The entire outfit is mounted on a covered truck. It is built in various capacities ranging up to 464 cu.ft. of free air per minute.

The cost for power of such an equipment is less than would be expected. Consider the case of a motor-driven compressor of 145 cu.ft. displacement. This would require a motor with a horsepower input of about 25 for 70 lb. air pressure. Three cents per electrical horsepower per hour is undoubtedly a liberal allowance for power in coal-mining regions. Interest, depreciation and repairs figured at 25 per cent. of the initial investment of such an equipment would amount to about $200 per year—a liberal estimate. Based on 300 working days per year, one shift per day, this figure would reduce to about 67c. per shift.

Supposing the work under consideration is the digging of a wide ditch through rock, employing two hand

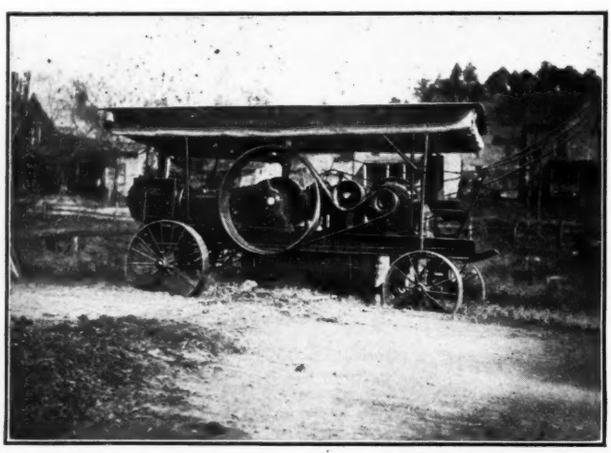


FIG. 6. PORTABLE ELECTRICALLY DRIVEN COMPRESSOR

drills for an 8-hr. shift, the cost would figure about as follows per shift:

Operator	$4.00
Two drill runners at $2.50	5.00
Lubricating oil	.50
Cost of power for air, 25 hp. for 8 hr. at 3c. per hp.	6.00
Interest, depreciation and repairs	.67
Total per 8-hr. shift	$16.17

No reduction is made in power charge for unloaded periods, which would undoubtedly reduce this charge considerably.

The footage accomplished with a Jackhamer drill is usually between 100 and 200 ft. of hole per day, depending upon conditions. We shall assume 150 ft. as an average accomplishment. The two machines would therefore drill 300 ft. per day. Thus the cost per foot of hole drilled would amount to $0.0539.

Under similar conditions the two drillers could put in by hand not over 20 or 30 ft. of hole per shift em-

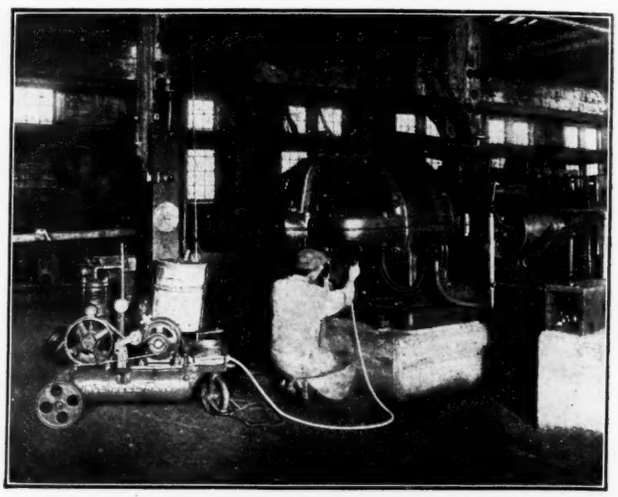


FIG. 7. CONVENIENT TYPE OF PORTABLE SHOP COMPRESSOR

ploying the "single-jack" method. Assuming the same rate of wages and an average accomplishment by hand of 25 ft. per 8-hr. shift, the labor cost would be $5 for the two men, and the cost per foot of hole 20c.; in other words, machine drilling with the portable compressor, including all charges, would result in a saving of $0.1461 per ft.; that is, a saving of about 75 per cent. The cost of sharpening steel has not been included in the foregoing estimate as it would be about the same per foot in each case.

If space permitted, similar comparisons could be worked out for other operations, showing the remarkable savings effected by employing compressed air supplied by a portable plant.

Fig. 7 shows a convenient type of portable compressor for use in shops, power plants and other places where a small amount of compressed air is required. The compressor proper is an air-cooled Imperial type XII vertical machine having a capacity of 6-cu.ft. displacement. A type of short belt drive similar to that used on larger machines is used to connect motor and compressor. The air receiver forms the body of the truck, and on it are mounted compressor, motor and all accessories, including a 20-ft. coil of air hose, plug and switch, wire, etc.

The Presence in Mine Gas of Ethane, propane and butane has been held to indicate that such gas did not wholly arise from the coal, but was partly or wholly from gas wells in the vicinity. However, if mine air does not contain these gases their absence does not prove that the atmosphere of the mine is necessarily free of admixture with gas from wells, because it has been found by the United States Bureau of Mines that out of 25 samples of natural gas from cities five were free of such hydrocarbons, among which cities were Texarkana, Ark.; Lewis and Mansfield, La.; Nowata, Okla.; and Corsicana, Tex. Some natural gas has as much as 20 per cent. of ethane, like that supplied to Louisville, Ky. It appears from the investigations of G. A. Burrell and G. G. Oberfell that the gas in one stratum may be free of ethane and that another below it may have as much as 5 per cent.

Mine Telephone Equipment

By Walter C. Freeman

SYNOPSIS—A detailed discussion of various telephone systems, with practical suggestions concerning the selection of a type suitable for coal-mine service. Metallic circuits are recommended in preference to ground-return circuits. Remarks concerning supporting and insulating the wires.

The many advantages and economies accruing from the installation of telephone systems in mines have been reviewed in the columns of mining periodicals at various times, but little space has been devoted to the discussion of equipment and its arrangement to give the most efficient operation. It is the purpose of this article to describe the operating features of the systems and apparatus most commonly used, also to offer some pertinent suggestions of practical value regarding installation of the equipment.

Telephone systems in general are classified into two main groups; namely, the "common battery" system and the "local battery" system. Each has its particular advantages for the class of service for which it was designed, though the speech-transmitting efficiencies under the same operating conditions are nearly equal in value. The main point of difference between the two systems is the method of supplying electrical energy to the telephone instruments.

In common battery operation, as the name implies, the current for all of the telephones in the system is supplied by one main battery, usually of the storage type, at a potential of approximately 20 volts. This battery not only furnishes the current for talking purposes, but for the operation of the various switchboard signaling devices as well.

It will be readily understood that this method of power supply is objectionable for mining service because any interruption of the current would totally disable the system. In addition to this serious drawback, the common battery system does not provide a means of signaling between any two telephones without the interposition of a switchboard and the assistance of the switchboard operator in establishing a connection. Furthermore this system when installed to meet the service requirements of mines of average size does not compare favorably with the local-battery system in the factors of first cost, maintenance and operating expense. For these reasons the common battery is seldom recommended or used for service underground and will be eliminated from further discussion herein.

The Local-Battery System

The telephones used with the local-battery system are equipped and wired to consume current for talking purposes, furnished by either two or three cells of dry battery which are placed within the housing of each telephone set. The alternating current which is required for ringing other telephones on the same line and also for signaling the switchboard in large systems is generated by a hand generator, which likewise is included in the equipment of each instrument. Under this arrangement it will be noted that each telephone is independent of an outside source of power, and consequently may be used either for systems comprising but two telephones or for larger systems with many instruments connected.

The local-battery system, when the electrical properties of the various pieces of apparatus in the telephones are properly proportioned, is quite flexible. Any number of telephones up to 15 may be connected in multiple to one pair of wires so that each telephone station may call and talk with any other on the same circuit without the aid of a switchboard and operator's service. The signaling between the various stations is accomplished by means of a system of code rings which are sounded upon all telephones simultaneously; therefore the number of telephones per line should be limited to about 15 so that the ringing code will not become unduly complex and difficult to transmit correctly. It is possible to operate as many as 40 instruments on a line, but the continual ringing of the bells and the complex code of signals would be distracting.

In mines where a greater number of telephones are required, the telephones are separated into groups of convenient number served by one line. The several lines are brought to the surface and centralized upon a switch-

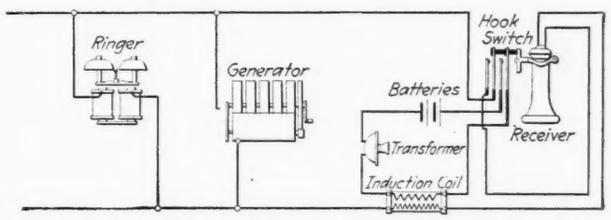


FIG. 1. ESSENTIAL PARTS OF A MINE TELEPHONE AND CIRCUIT CONNECTIONS

board so that a connection may be established between any two telephones in different groups. This connection to the switchboard does not affect the ability of any station to independently call and converse directly with any other telephones connected to the same line. An injury to a telephone or an open circuit in any section of the line wire will not in the majority of cases interfere with the operation of the rest of the system as a separate unit. The local-battery system is simple to install and maintain and in addition is generally less expensive in first cost and annual charges than the common-battery system.

The three principal elements of a mine-telephone system are the telephone sets, the line construction and the switchboard. The electrical properties of telephones intended for mining service are largely the same as for local-battery telephones used in the smaller towns and villages, but the mechanical construction of mine telephones is quite different owing to the severe hazards to which telephones are exposed underground.

Mine Telephones Should be of Rugged Construction

In mining service the instruments are frequently exposed to mechanical injuries such as falls of rock and ore, rough handling by careless workmen, concussion of blasting and other conditions that will suggest themselves

to the reader. Besides these hazards there are many localities in which the telephones are subject to excessive moisture and the corrosive action of acid mine waters and gases. These conditions have been taken into consideration by telephone manufacturers who have developed and now sell telephones designed especially for service in mines.

In order to thoroughly understand how the instruments operate let us consider Fig. 1, which diagrammatically shows the essential parts of a mine telephone and the circuit connections. This circuit arrangement is known to telephone men as a "bridging" telephone circuit because of the position of the polarized ringer and the hand generator, which are connected in multiple to or bridged across the line wires. In this circuit the ringer operates whenever the alternating ringing current traverses the line. The hand generator is equipped with an automatic circuit closer so that it is connected in the circuit only when the crank is turned while calling another telephone station. The object of this switch is to remove the low resistance path through the generator armature which would seriously impair the ringing and talking qualities of the circuit. The permanent connection of the ringers is necessary for the reception of the signals and does not reduce the talking efficiency to any appreciable extent, because the coils have a total resistance of 1,000 ohms or over and a high choking effect toward the passage of the voice currents via the ringers.

The talking circuit includes the transmitter, induction coil, receiver and the hook switch. The latter piece of apparatus is operated by taking the receiver from between the jaws of the hook. In some telephones the hook switch is controlled by the weight of the receiver and is operated by the upward thrust of a spring when the receiver is lifted from the hook. The hook switch in its operated position closes two pairs of contacts. One pair closes the circuit from one line terminal through the receiver and secondary winding of the induction coil back to the other line terminal. The other pair of contacts controls the battery supply and closes a circuit including the transmitter, the primary winding of the induction coil and the battery.

How the Voice Is Transmitted

When the user speaks into the transmitter, the sound waves impinge upon the transmitter diaphragm and impart to it a vibratory motion. The vibrations are carried by means of a small piston to a polished carbon electrode, which is separated from another like electrode by small carbon fragments of uniform size. The electrical resistance between the two electrodes, which are connected to the transmitter terminals, is variable and depends upon the area of contact between the various fragements of carbon and the electrodes. Under the varying degrees of pressure on the piston the resistance of the transmitter is raised or lowered and passes a current of ever-changing value which corresponds in amplitude to the sound waves of the speaker's voice. The undulating current flows in the primary winding of the induction coil, which in reality is a small step-up transformer. It not only steps up the voltage, but also allows the transmitter to operate in a local circuit where it is not affected by the resistance of the line circuit.

When the incoming voice currents are impressed upon the receiving telephone they do not pass through the ringer coils because of their high impedance or choking effect of the windings, but continue on through the secondary winding of the induction coil and the receiver. The receiver contains a U-shaped permanent magnet whose pole extremities are each surrounded by small electromagnet coils which are connected in series. A thin soft iron diaphragm is clamped at right angles to the pole faces of the magnet so as to lie within its magnetic field. The voice currents are alternating in character, and part of each wave augments the field of the permanent magnet through the action of the electromagnet coils and increases the pull on the diaphragm, causing it to further approach the poles of the magnet. Conversely the other and opposite portion of the wave diminishes the tractive effect of the magnet because the current opposes and counteracts a part of the permanent field and allows the diaphragm to recede. The rapid recurrence of this action results in a vibrating movement of the diaphragm which gives motion to the surrounding air and reproduces the sounds spoken into the transmitter at the distance station.

When the receiver is replaced upon the hook, the battery circuit is opened so that no energy will be consumed while the telephone is not in use. The receiver circuit is also opened in order to remove the low resistance path in multiple to the ringers which would seriously impair the operation of the latter apparatus. Some telephones are wired for and equipped with a condenser in the receiver circuit. The electrical properties of this kind of condenser are such that it forms a practical bar to the passage of the alternating current of low frequency used for ringing, but offers little resistance to the high-frequency voice current. This is a valuable device in that it eliminates the ringing trouble frequently experienced on local-battery telephone lines, owing to the failure of the last user to hang up the receiver at the end of a conversation.

Specifying a Telephone Equipment

In ordering equipment for a mine telephone system it is well to specify that the instruments be equipped with ringers wound to a resistance of about 1,600 ohms. This resistance value is low enough to insure ample current flow in the ringer coils and a clear loud signal, yet high enough to allow the installation of 15 or 20 telephones on one line without unduly overloading the hand generators. The resistance of the ringers in the various telephones connected on the same line should all be equal, otherwise the telephones equipped with low-resistance ringers will consume the greater share of the ringing current and cause the ringers wound higher to ring weakly, if at all.

The local operating conditions and service requirements in mines are so varied that it is impracticable to attempt to recommend any standard practice covering the number and locations of the telephones. In some states laws have been passed to govern the minimum number of instruments to be employed and the places where they must be used. In laying out a system it would be well to consult the state mining laws to see that these regulations are observed and provision made for as many additional stations as good service and economy demand. It is the usual practice to install one telephone within convenient distance of each group of miners so that reports and orders may be quickly and easily transmitted.

Fig. 2 shows a portion of the plan of a mine and the locations of the instruments. In this diagram the squares

represent the telephones and the circles the loud-ringing extension bells connected by temporary wiring to each telephone. The telephones are located in the main passageways so as to take advantage of favorable air currents for carrying the sound of the gongs in the proper direction as far as possible. The extension bells are used to avoid the necessity of moving the telephones as the work advances and so that the signals will be heard clearly above the noise of running machinery.

Although local-battery mine telephones will operate on a circuit consisting of one wire and the earth for the so-called return, it is the best practice to employ a full metallic circuit consisting of two wires connecting all instruments. Ground-return circuits are objectionable in that they are extremely liable to become noisy owing to foreign currents, especially in mines where electricity

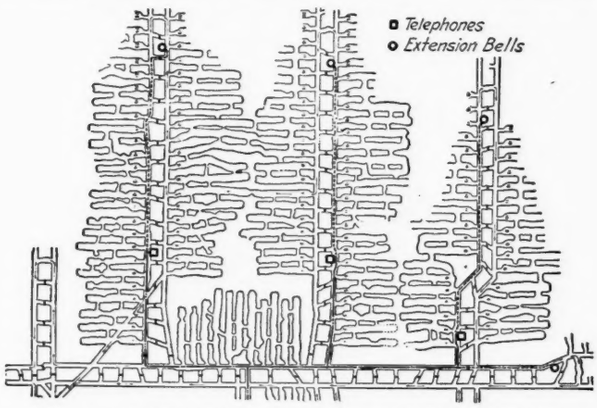


FIG. 2. PLAN OF MINE, SHOWING LOCATION OF INSTRUMENTS

is used for haulage and the operation of drills and cutters. Furthermore the ground connection is in many cases difficult to perfect and there is liability of "cross-talk" or interference between simultaneous conversations on separate lines of this kind.

The Most Satisfactory Type of Circuit

The metallic circuit is more expensive to install owing to the additional amounts of material and labor, but this difference is offset by the gain in reliability and efficiency. The kind of line wire to be used is a matter of choice, depending upon the local conditions. Iron, copper and copper-clad steel are the conductors generally used, and in all cases these wires should have a heavy insulation and a substantial weatherproof exterior braid. No. 12 B.w.g. iron wire insulated in the manner described is entirely satisfactory for mine systems as to electrical properties and mechanical strength, but should be used only in dry mines. In localities where there is much seepage, especially of waters having an acid reaction, lead-covered and rubber-insulated twin copper wire should be employed. Insulated copper-clad steel wire of the No. 14 B. & S. gage has been used to some extent in place of iron wire with good results. This wire has the tensile strength of steel and a conductivity about 40 per cent. of that of pure copper wire of the same diameter.

The wires should be supported much in the same manner as electric light and signal wires, on either porcelain knobs or glass insulators fastened to the roof timbering. The same precautions for insulating electric light circuits should also be observed in the construction of telephone lines. The clearance between the telephone lines and such circuits should be kept at the maximum distance to avoid accidental contact and to reduce the electromagnetic induction between the two systems. In some places where lighting and power circuits parallel the telephone lines for a considerable distance, the foreign currents caused by induction make the telephone lines so noisy that conversation is nearly impossible. To diminish this interference it is necessary to use either twisted-pair telephone wires on such parallel runs or to transpose the two wires of the telephone circuit at frequent intervals. Either method exposes each wire of the pair equally to the disturbing influence and balances the circuit so that the induced currents in each tend to neutralize. Under this condition there is no flow of induced current; therefore no extraneous noise is heard in the telephones.

All splices should be made with wire connectors or else well soldered without the aid of acid soldering pastes or compounds. Bad splices are intermittent sources of trouble and are extremely hard to locate. Where wires pass under or over pipes or through holes liable to abrade the insulation they should be covered with "circular loom," "flexduct" or porcelain tubes.

As before stated it is necessary to use a switchboard for connecting the various lines when the number of telephones installed does not permit the connection of all instruments to one circuit.

One switchboard scheme used by a West Virginia mining company appealed to me as an ideal equipment for a small system. The company in question used a small switchboard and had it equipped with a small double-pole double-throw switch in connection with each of the ten line equipments installed therein. The purpose of these switches was to disconnect the lines from the switchboard and to connect them to a pair of bus wires at night so that any telephone might call any other without the necessity of keeping the operator on duty when the volume of traffic was light. As each line carried but three telephones, each station could easily signal any one of the remaining 29 stations. This instance is cited to show that, with a little study, telephone systems can be worked out so as to give maximum convenience and economy.

Coal Fields of Indiana

By Frank I. Pearce*

The productive coal area of Indiana is located in the southwestern part of the state and constitutes the eastern edge of what is known as the eastern interior coal region. The area occupied by "coal measures" embraces about 6,500 sq.mi. To say, however, that the coal fields of Indiana cover so large a territory does not mean that coal beds of a minable character are to be found everywhere under this area.

There are large portions within the general field where, although the rocks are of carboniferous age, no local seams whatever are to be found. There are other areas of large size which contain coal, but are lacking in workable seams. To say, therefore, that Indiana has or did have 6500 sq.mi. of coal lands is an entirely erroneous statement. There are within the state of Indiana 15 or more seams of coal varying in thickness from a black mark to strata which in some places are 10 ft. thick.

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The Lateral, or Side, Friction of Hoisting Ropes

SYNOPSIS—Formulas connecting the length of the hoist, the distance from sheave to hoist drum, the ratio of rope diameter to that of the drum, and the angle made by the rope in its central and extreme positions are proposed.

The side, or lateral, friction of winding ropes was the subject of a paper presented by H. W. G. Holbaum at a meeting a few months ago of the North of England Institute of Mining and Mechanical Engineers. He said therein that practical men are inquiring for a simple formula connecting the various factors which determine the amount of lateral friction encountered by a winding or hoisting rope as it travels from one side of the drum to the other.

His object was to submit such a formula and to initiate a discussion leading possibly to the solution of the problem. It had been solved by the Koepe system, but a satisfactory solution for the case of the ordinary wide drum has yet to be found.

An Equation for Side Wear

Let A equal the angle of maximum friction in degrees. When a rope between the pulley and the drum lies in the same vertical plane as that of the pulley, there is no lateral friction. In practice the angle of maximum friction will probably be found to be not less than 1 deg. and not more than 3 deg. The purely numerical value of A therefore ranges from 1 to 3. Then the ropes being central on the drum at meetings of the cages.

$$A = \frac{10\,H}{R\,L} \tag{1}$$

Where

H = Length of cage travel from receiving to discharge position;

L = Length of the rope extending from the sheave to the drum;

R = Ratio of the drum diameter to the normal diameter of the rope.

This ratio is from 110 to 150 in English practice. H and L may be taken in any units, but both must be in similar units. If it be deemed expedient that A shall not exceed a given predetermined numerical value, the winding engine must either be placed at such a distance from the pit that

$$L = \frac{10\,H}{A\,R} \tag{2}$$

or the drum must be of such a diameter that

$$R = \frac{10\,H}{A\,L} \tag{3}$$

That is to say, if D = drum diameter and d = rope diameter, both stated in similar units, the following formula must be taken:

$$D = d \times \frac{10\,H}{A\,L} \tag{4}$$

If the width of drum required for each rope is W, then

$$\left.\begin{aligned} W &= x + \frac{7\,H}{20\,R} \\ \text{or} \\ W &= x + \frac{7\,A\,L}{200} \end{aligned}\right\} \tag{5}$$

where x = the additional width required to accommodate the two or three holding coils of rope that remain on the drum when the cage is at the pit bottom. In (5), W, x, and A (or L) must all be taken in the same units (feet, inches, etc.).

Some Quantities Are Fixed

It will be seen by (1) that since H cannot be altered for a given mine, A can be reduced only by increasing L or R or both. There is a practical limit to the permissible value of L, since most managers prefer that the engineman shall have a clear view of the dumping operations of the cages. Probably L may legitimately be extended to be 50 yd., in which case any reasonable value of R will reduce the angle A of maximum friction to about 1½ deg., always provided that the ropes are so adjusted as to center themselves at cage meetings, or mid-travel. The lateral friction should be quite a negligible quantity in the case of the shallower mines.

The value of R may be increased in either or both of two ways—the diameter of the drum may be increased or that of the rope may be reduced. Mr. Holbaum believes that as the problem of electric hoisting approaches more closely to its complete solution the present necessary connection of the bigger engine with the bigger drum will disappear, owing to the already proved superiority which electrical systems possess in the matter of elasticity. He summarized as follows:

1. Other things being equal, the lateral, or side, friction will be at a minimum if the rope assumes a position in the center line of the drum at midwind.

2. Other things being equal, the lateral friction varies inversely as the distance L intervening between the sheave and the drum.

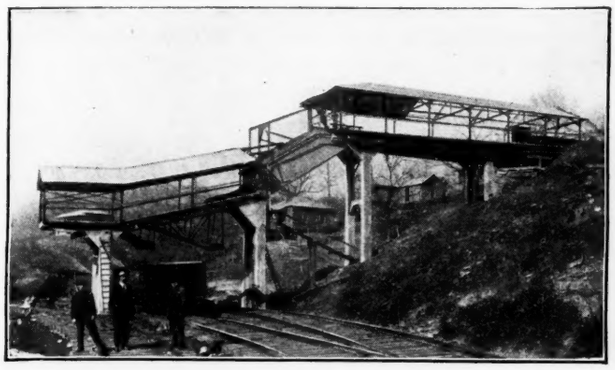
3. Other things being equal, the lateral friction varies inversely as the ratio R which the diameter of the drum bears to the diameter of the rope. The magnitude of the ratio R may be augmented, not only by increasing the diameter of the drum, but also by decreasing the diameter of the rope—that is, by using only the best material—so that a smaller diameter of rope may suffice for a given load.

4. Other things being equal, the lateral friction varies as the square of the angle A.

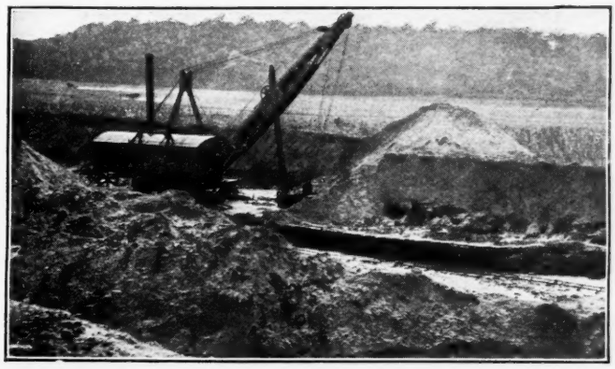
5. Other things being equal, the destructive character of the lateral friction varies with the roughness of the rope; hence, ropes of the flattened-strand and locked-coil types suffer less than ropes of the ordinary type because their surfaces are smoother.

6. It is also obvious that the lateral friction in any given case will be much less if the rope is kept thoroughly lubricated than it can possibly be if this point is even partly neglected.

Snapshots in Coal Mining

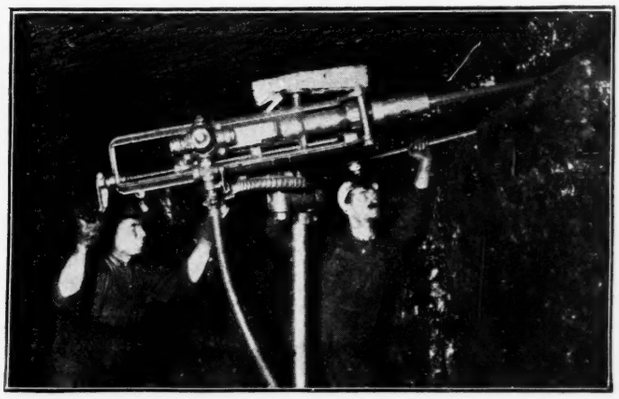


CONCRETE TIPPLE AT HAZARD, KY.

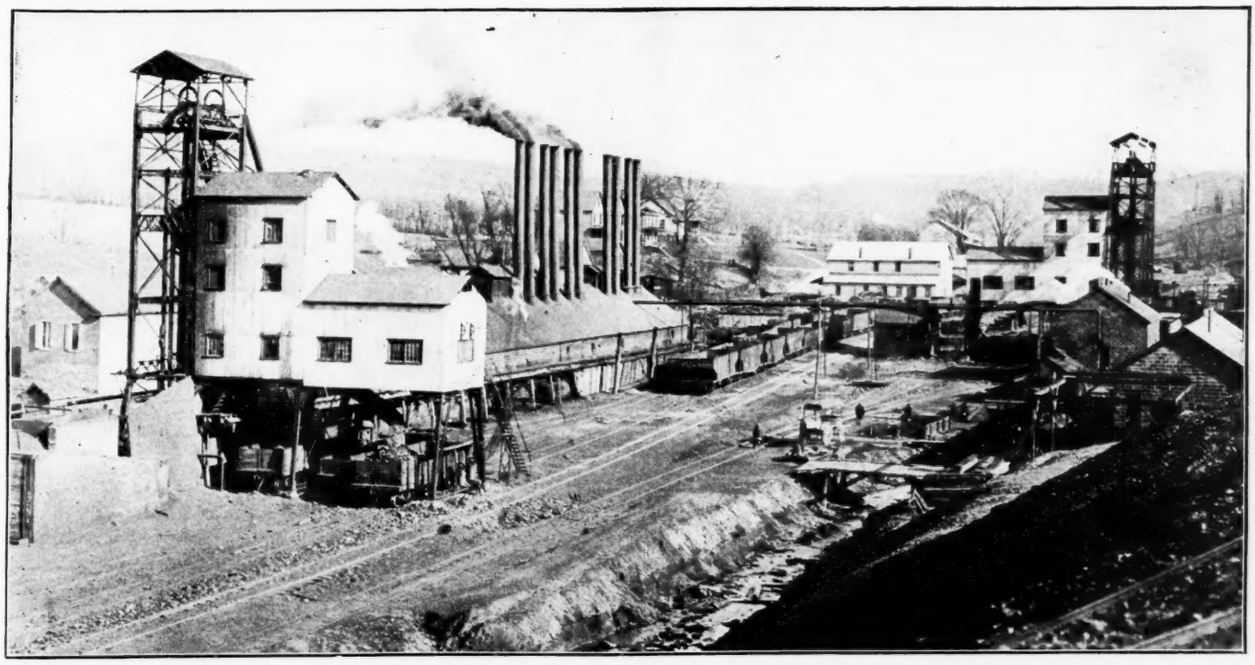


STRIPPING NO. 7 SEAM, DANVILLE, ILL.

FAIRFAX MINE, FAIRFAX, WASH.



SULLIVAN POST PUNCHER, LAFAYETTE, COLO.



TWO TIPPLES OF YOUGHIOGHENY & OHIO COAL CO., WASHINGTON COUNTY, PENNSYLVANIA

Importance of the Welsh Coal Fields

The importance of Cardiff and of the South Wales coal field as the sole source of supply of fuel for the British Navy and for most of the French ships has attracted such attention to the district that some particulars about the field may be of interest, says Consul Lorin Lathrop in *Commerce Reports*.

The Welsh coal field has a superficial area of 1,000 square miles. There are 700 mines in operation, and the number of employees above and below ground is nearly 250,000. The product ranges from bituminous to anthracite and includes the Cardiff smokeless steam coal, accepted in Europe as indispensable for naval vessels. The classification of the coals of the field is as follows:

(1) Bituminous—House, gas, coking, and manufacturing coals.

(2) Steam and anthracite—Coal for steam raising, malting, lime burning, gas power, hop drying, etc.

(3) Semibituminous, or second-class steam—Coal applicable for stationary engines and bunkering of steam vessels.

(4) First-class steam—Coal in seams from which Admiralty is supplied, and coals of similar quality.

Coal at a Depth of More Than One Mile

The quantity unworked in best steam coal seams 1 ft. thick and upward in the collieries on the Admiralty list is estimated to be in excess of 3,000,000,000 tons, of which two-thirds is in seams of 2 ft. and over. The field is expected to yield in the future over 8,000,000,000 tons of bituminous, 6,000,000,000 tons of anthracite and nearly as much of the semibituminous, or second-class steam coal, and 4,000,000,000 tons of free-burning steam coal in the western division. The greatest estimated depth at which the coal lies is 6,050 ft. The coal is stated to be the most costly in the world to raise. Owing to the geological and labor conditions the output per man employed is the lowest in any great field of the world, being about 230 tons per annum. The mining valleys are intersected with a network of railways that connect with the trunk lines of England, and also with the ports on the south from Newport, Monmouthshire, on the east, to Llanelly on the west.

Cardiff is the main outlet for the field and is the leading coal-shipping port of the world. The annual shipments exceed 25,000,000 tons, and always represent approximately half the production of the district. The yield for 1914 is considered to have exceeded 52,000,000 tons, a record year with the exception of 1913, when the output exceeded 56,000,000 tons. Of the total output, 10,000,000 to 12,000,000 tons is of the quality known as best Admiralty coals. Since the beginning of the war the exportation of this grade has been prohibited.

Exports of Coal, Coke and Patent Fuel

Exports of coal, coke and patent fuel from the United Kingdom for the first seven months of 1914 amounted to 43,000,000 tons, a falling off as compared with the corresponding period of the great boom year of 1913 of 1,257,000 tons. For the five war months shipments were 18,860,000 tons compared with 32,360,000 tons for the last five months of 1913. The total foreign and colonial shipments from the United Kingdom in 1914 were 61,680,000 tons compared with 76,700,000 tons in 1913. The average value per ton f.o.b. was $3.30 in 1914, against $3.40 in 1913. Shipments from the United Kingdom to France were hardly reduced by war conditions; they exceeded 12,000,000 tons in both 1913 and 1914. Exports to Italy were reduced by 1,000,000 tons, and to Spain and Egypt by more than 500,000 tons each. Exports to Brazil fell from 1,900,000 tons in 1913 to 1,200,000 tons in 1914; and to Argentina, from 3,700,000 to 2,900,000 tons.

Exports Were 16,000,000 Tons

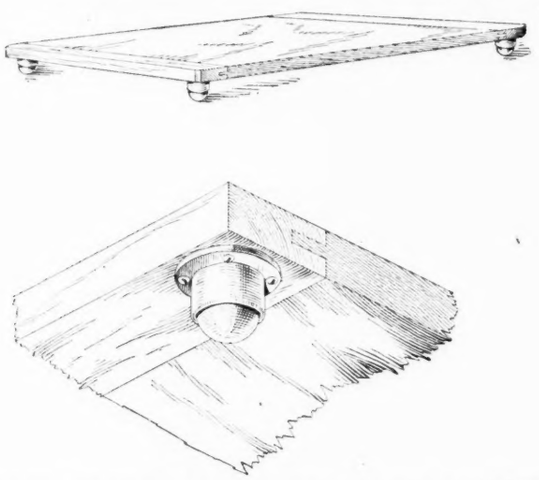
Foreign shipments from Cardiff in 1914 amounted to 16,000,000 tons, as against 19,300,000 tons in 1913. In addition to the 1914 figures given, supplies were sent to the fleet of which no estimate can be given. Coastwise shipments were figured at 2,000,000 tons, a falling off of 800,000 tons; for foreign bunkers, 2,900,000 tons; for coastwise bunkers, 100,000 tons. These figures representing the coal trade of Cardiff for 1914 total 21,000,000 tons; the coal trade of Newport was 5,600,000 tons.

The following table shows the range of prices of coals in 1914 per ton of 2240 lb. f.o.b. Cardiff or Newport:

Kinds	Jan. 1	Highest During Year	Lowest During Year	Dec. 1
Best Admiralties	$4.98	$5.34	$4.37	$5.04
Best seconds	4.68	4.98	4.25	4.74
Seconds	4.56	4.74	4.13	4.56
Best smalls	2.73	3.04	1.76	3.10
Cargo smalls	1.88	2.43	1.39	2.43
Monmouth black veins	4.43	4.56	4.01	4.43
Western valleys	4.25	4.43	3.89	4.31
Best house (at pit)	4.86	4.86	4.80	4.80
No. 2 Rhondda	3.58	3.64	3.10	3.64
Patent fuel	5.10	5.10	4.01	4.31
Foundry coke	6.07	6.07	5.34	6.07

Ball-Bearing Drawing Board for Freehand Work

In making freehand drawings the board must be turned and shifted frequently to accommodate the hand to different curves and lines. Every time the change in position



TWO VIEWS OF DRAWING BOARD, SHOWING HOW THE CASTERS ARE FITTED ON

is effected the fingers must be deftly inserted between the board and the table. I provided my board with four ball casters, as sketched, to facilitate this turning and shifting. The casters are a standard article readily bought anywhere. I found this board very valuable for freehand work.—E. Schwartz, Brooklyn, N. Y.

Meeting of Rocky Mountain Coal Mining Institute

The fourth regular meeting of the Rocky Mountain Coal Mining Institute, with 42 members in attendance, was called to order Monday morning, Nov. 29, 1915, by President E. H. Weitzel, who delivered a short address.

Governor George A. Carlson of Colorado then welcomed the members on behalf of the State of Colorado. This was followed by an address of welcome by Mayor W. H. Sharpley on behalf of the City of Denver.

The minutes of the previous meeting held at Trinidad, Colo., June 8, 9 and 10, 1915, were read by the secretary. There being no corrections or alterations, they were approved as read.

An amendment was proposed by R. C. Hills to article 3 of the constitution, adding thereto, "and a publication committee consisting of three, including the secretary as an ex-officio member," so that the article will read: "The officers of this institute shall consist of a president; four vice-presidents, one to be elected from each state in which the institute operates; a secretary-treasurer; an executive board of 13 members, consisting of the president, the four vice-presidents and two other members from each state in which the institute operates, and a publication committee consisting of three, including the secretary as an ex-officio member."

Section 6 to be added to article 9, "Duties of Officers," will read: "It shall be the duty of the publication committee to receive and edit the papers to be read and issue with the notification circular a brief synopsis of each paper for the purpose of promoting discussion thereon; to arrange all copy for publication; read all proof, and assist in the distribution of the semiannual transactions."

The amendment was read and laid over until the next regular meeting for a vote.

The meeting then proceeded with the nomination of officers for the ensuing year. The president appointed a nominating committee consisting of Benedict Shubart, G. A. Kaseman, A. C. Watts and M. B. Urquhart. For the office of president the committee selected the names of E. H. Weitzel, W. J. Murray and John McNiel. A. C. Watts was nominated from the floor.

A ballot was then taken, and A. C. Watts having the majority of the votes cast, was declared elected and immediately assumed his duties of office.

The nominating committee then reported their selection of the following names: J. C. Roberts, Golden, vice-president for Colorado; F. R. Weitzel, Dawson, vice-president for New Mexico; A. H. Cowie, Salt Lake City, vice-president for Utah; W. D. Brennan, Cheyenne, vice-president for Wyoming; F. W. Whiteside, secretary-treasurer, Denver.

The names proposed for the executive boards of the following states were: Colorado, S. Dean, of Delagua, and W. C. Ferguson, of Denver; New Mexico, G. A. Kaseman, of Albuquerque, and F. A. Young, of Raton; Utah, E. L. Carpenter and G. A. Murphy, of Salt Lake City; Wyoming, William Monay, of Kemmerer, and Peter Kooi, of Kooi.

There being no contest for any of the offices, the secretary was instructed to cast the ballot for each of the names, and they were severally declared elected.

A vote of thanks was extended to E. H. Weitzel and Frederick W. Whiteside for their services to the institute during their respective terms of office. A vote of thanks was also extended to all retiring officers.

The president was authorized to appoint a jewel committee to select a token of appreciation for the retiring president. The following were appointed: Messrs. Urquhart, Kaseman, McGraw and McGowan.

Motion was duly made, seconded and carried that it be the sense of the institute that the elaborate entertainments of the past be discontinued at the regular meetings in the future, that no free entertainments be accepted by the institute and that each member pay his own expenses. The executive committee was appointed to suggest at the next meeting a suitable emblem for the institute.

Benedict Shubert was requested by the chair to read a paper prepared by John Bevan, of Colorado Springs, who was absent, the subject being "Colliery Explosions." There being no further business the morning session adjourned.

The meeting was again called to order at 2:30 p.m., with President A. C. Watts in the chair.

A paper was read by Mr. Watts, the subject being, "Features of Coal Mining in Utah, Principally in Carbon City." This was followed by a discussion.

At 8:15 p.m. the members and friends of the institute attended the Denham theater, where the production, "Under Cover," was presented in a highly creditable manner by the Denham Players.

At 10 a.m. on Nov. 30 the meeting was called to order by President Watts. A vote of thanks was extended to the committees on arrangement and entertainment for their efficient services in making preparations for the present meeting.

The secretary was instructed to extend a written vote of thanks to the management of the Albany Hotel for the use of the convention hall and for the many courtesies extended.

The following candidates having been regularly proposed, were balloted upon and declared elected: A. A. Young, John Murrell, William B. Phillips, William R. Chedsey, J. B. McKennan, Arthur V. Lindee, J. J. Thomas, David Williams, Ernest Curran, Morgan T. Townsend, Fred Carroll, Harry Wolf, Frank Dayton, Walter Macpherson, John McNeil, Jr.

A paper was next presented by Dr. William B. Phillips, the subject being, "Coal Resources of the West." This was followed by a long and interesting discussion.

On motion duly made, seconded and carried, it was

Resolved, That individually and collectively the institute lend its support to the School of Mines of Colorado and institutions along similar lines in our three neighboring states in which our institute operates toward the promotion of coal-mining activities and the establishment of a chair of coal-mining engineering.

Mr. Martin Maurer then presented a paper on "Tipple Scales." There being no further business the meeting adjourned.

At 1:30 p.m. members and friends of the institute left for a trip through Denver's Mountain Parks, stopping on the return at the gymnasium of the School of Mines, at Golden, where an enjoyable reception was held and refreshments served, after which the members were shown over the grounds and through the various buildings of the institution.

At 8 p.m. members and friends of the institute attended the Colorado Electric Show being held at the Auditorium.

Abuse of Blasting Fuse

Many miners, acting in good faith and recognizing the waterproofing quality of axle grease or crude oil, apply these lubricants to the outside of capped fuse so as to make a waterproof joint, but by so doing they only start trouble for themselves. Grease and oil are solvents of the fuse varnishes, and when they penetrate the outer covering they destroy the powder train in the fuse with as great, if not greater, rapidity than would the water that the miner is trying to exclude.

When preparing fuse for use, it is common practice to coil it around the arm as one would a clothesline. This is bad practice because kinks are liable to occur to break the powder train. When cutting off the fuse care should be exercised to cut it square across and not obliquely, for the latter method will leave a sharp point at the end of the fuse—not a particularly safe thing to jab into a blasting cap. Furthermore, if the point happens to be soft, as it is likely to be in warm weather, it will bend over or curl up and so will be liable to cause a misfire. Misfires are more likely to be due to lack of care on the part of the miner making up the primers than to fault in the fuse itself.

When making up primers, do not hesitate to cut an inch of fuse from the end of the coil. By doing this the damp end is cut off and is not put into the detonating cap. Fuse that has been hammered or injured by falling ground, or damaged from any other source, should never be used. Any change in the covering of the fuse will either increase the burning rate or have the opposite effect and cause a misfire.—*Engineering and Mining Journal.*

Anthracite 2,458,125 Tons Short

The total shipments of anthracite, as reported to the Anthracite Bureau of Information, for eleven months of this year were 2,458,125 tons less than for the corresponding months of 1914. Shipments of anthracite last month were 6,297,215 tons as against 5,928,286 tons in November, 1914, an increase of 368,929 tons. This establishes a new record for November. The largest previous shipments for this month were in 1911, when 6,193,314 tons were sent to market.

The amount of coal on hand at tidewater decreased 15,160 tons, from 625,821 tons on Oct. 31 to 610,661 tons on Nov. 30. The decrease in the amount of coal at tidewater has been going on steadily for the last three months and indicates that the stocks at tidewater are being drawn upon to make up for the slow sales last summer when the public failed to take advantage of the usual discounts.

The Lehigh Valley led in tonnage for the month with 1,190,103 tons; the Philadelphia & Reading was second with 1,163,851 tons; and the Delaware, Lackawanna & Western was third with 971,389 tons. The Jersey Central carried 762,140 tons, the Erie 696,890 tons, the Delaware & Hudson 694,386 tons, the Pennsylvania 616,190 tons and the New York, Ontario & Western 202,266 tons.

Extracts from a Superintendent's Diary

Tomorrow our camp will have its first community Christmas. The tree has been erected, the presents have been carefully assembled in our commissary wareroom, and the kids of our community have all been properly tipped off as to the possibilities of the morrow.

Every firtree standing within a radius of ten miles of camp has been inspected several times during the past week, and the one finally selected for the great occasion had to be admired and passed on by the entire committee before our timberman was allowed to cut it down.

Many were the plans proposed for the raising of the necessary funds to meet the expenses of the celebration, and in the end no single plan was adopted, but each one was instructed to consider himself a committee of one to carry out any one of the suggestions made and to remain as a committee until some money was obtained. The results were truly startling; enough money was collected to provide a suitable tree for a good-sized city. After buying all of the presents that we thought might be needed, we had enough left to enable us to hire a band

Ballads of a Coal Miner—X

Written expressly for Coal Age

Progress

BY BERTON BRALEY

WE'VE got a new manager now
Who's doin' things proper an' right,
For he's cleanin' up fine around tipple an' mine
Which was once an offense to the sight;
He's tearin' down dingy old shacks
An' buildin' new houses instead,
Where the walls ain't a sieve an' a feller can live
With a decent roof over his head.

WE'VE got a new manager now
Who's holdin' down tailin's an' dust,
An' is givin' a show for a garden to grow
Which used to give up in disgust;
He's bringin' us water an' walks
An' roadways that's decently wide,
An' he'll change this in time from a town that's a lime
To a fairly good place to reside.

I HAD just about made up my mind
That it wouldn't be fair to a dame
To talk wedded bliss in a dust heap like this,
But now it don't seem quite the same;
For in place of the shacks there is homes,
An' that makes a diff'rence somehow,
An' I guess we'll get hitched now conditions is switched,
For we've got a new manager now.

of 12 pieces for the entire day and also a caterer who will serve hot chocolate and wafers to all who come out to see what a community Christmas can be.

The committee intrusted with the responsibility of selecting the presents had the most strenuous time, and once or twice it looked as if they would have to agree to disagree. It was composed mostly of ladies, and, womanlike, they wanted everything to be suggestive of the spirit of Christmas. They are still undecided as to whether they displayed judgment in their selections, and they await tomorrow's events as anxiously as the children.

We have men of many different nationalities who have spent Christmas in many corners of the globe, and the celebration that they have planned promises to afford a goodly number of surprises. Several newspaper men have learned of the possibilities and are going to be on hand with their notebooks.

Even our absentee directors heard of our plans and requested permission to have a hand in the affair. They were allowed to send contributions of money, and the way they responded made some of our citizens who have been in the habit of saying unkind things about them feel pretty small. Already both parties to the misunderstanding have undoubtedly been repaid for all of the time and effort contributed.

One unlooked-for controversy stirred up by our proposed celebration had to do with the question as to what date should really be considered as Christmas. Since the Slavs were hopelessly in the minority in our camp, they finally agreed to join in the celebration in spite of the fact that they feel sure that we are crazy on dates. Nor were our Slavs the only citizens who had their plans disarranged by the community celebration. We have two German families in our village which for years past have each had a family Christmas tree annually. Year after year most of the families in camp have been given invitations to inspect both of those trees, and the next day, at the request of the exhibitors, a vote had to be taken to decide which one was the most artistic. The rivalry was keen, the tree ornaments were preserved from year to year, and new trinkets were constantly watched for. This year all of those treasured ornaments were turned over to the general committee, and it is doubtful if they can be returned. Truly ours is to be a community tree.

Photographing Mine Maps

By H. A. Williamson*

Hydrochinon (a coal-tar product) is practically the only developer used in the photographic studios of the various engineering departments of the mining and other companies that use the camera to reproduce their various maps. Hydrochinon comes from Germany, normally at a price of $1.85 to $2.25 per pound, but at present quoted at $8 to $12, with little or none available at any price. Hence these engineer-photographers will probably be glad to try the following formula which does away with hydrochinon:

Water	30 oz.
Potassium carbonate (C.P.)	200 grains (desiccated)*
Sodium sulphite (C.P.)	480 grains (desiccated)*
Potassium bromide (C.P.)	30 grains

*If crystal chemicals are used instead of desiccated, then use 1 oz. of potassium carbonate and 2 oz. sodium sulphite.

*Fairmont, W. Va.

Just before use, add 3 grains of dry C.P. pyrogallic acid to each ounce of the solution required, using sufficient of the solution to cover the plate well, say about 16 oz. for an 11x14 plate in a tray 12x15. This 16 oz. should develop three to four 11x14 plates. Development should be complete, and of excellent density in line work, in 4 to 8 min.

After development is complete the plate should be transferred to a bath of water, 30 oz., and citric acid, 60 grains, and allowed to remain for a few minutes. From this bath it should pass to the regular acid fixing bath.

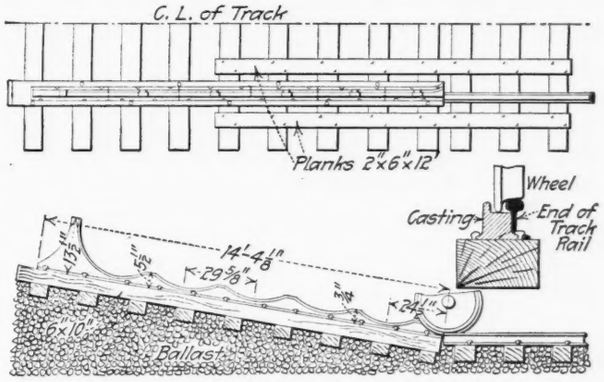
Slightly more contrast can sometimes be secured by adding a small quantity of potassium ferrocyanide to this developer. The temperature of all baths should be 70° F.

At present there is no scarcity of pyrogallic acid, which is quoted in quantity in the eastern market at from $2 to $3.25 per pound.

Car Stop of Novel Design for Use in Yard Tracks

A car stop that catches the wheels of cars instead of acting as a bumper has been applied by a number of railways, especially on stub tracks ending at streets or other points where it would be dangerous for a car to overrun the track. In the past a large number of very serious accidents have occurred at just such locations where the ordinary bumper had been installed by the railroad or mining company.

As shown in the drawing, the new bumper consists of two sets of castings forming a 15-ft. continuation of the track rails and having a series of concave depressions



DETAILS OF ARRANGEMENT FOR STOPPING RAILROAD CARS

to engage the wheels. These castings are placed on 6x10-in. stringers, inclined to give a rise of 24 to 30 in. at the rear end. It would take very high speed to drive a car to the end of this device, and the raised end would then keep it from over running. The depressions are about 29 in. c. to c., with a drop of 3¼ in. for the first two and 5½ in. for the others.

The car wheels ride on their flanges on the car-stop and the brakeshoes and rigging are carried clear of the ridges, as shown in the section in the accompanying drawing.

The device is made by the Saunders Car Stopper and Equipment Co., 113 North 2nd St., St. Louis, Mo. The Southern Railway Supply Co., St. Louis, is sales agent.

Burning Coal in the Army

By Marston Wilder*

SYNOPSIS—In years past coal was issued to men in the army according to their rank. This was conducive to much waste. At present the allowance of coal has been reduced to a thoroughly scientific plan. Not only is fuel purchased on the basis of its heat content, but it is issued according to climatic necessity and burned under the supervision of a trained fireman.

It used to be that coal was handled on the "hustle and use it" plan in the army. The easiest and quickest way the mineral could be bought, distributed and consumed was the means that best suited those who were compelled to handle it. As an illustration of the lack of consideration of the cost and value of the fuel an anecdote common in military circles serves best.

An officer who knew as much about coal as a prehistoric fossil was detailed to inspect several carloads delivered at a post by a contractor. He protested that he was not qualified to intelligently perform the task, but lack of knowledge availed him nothing in escaping the duty. Forthwith he went to see the coal and reported that it was black and that he thought it would burn.

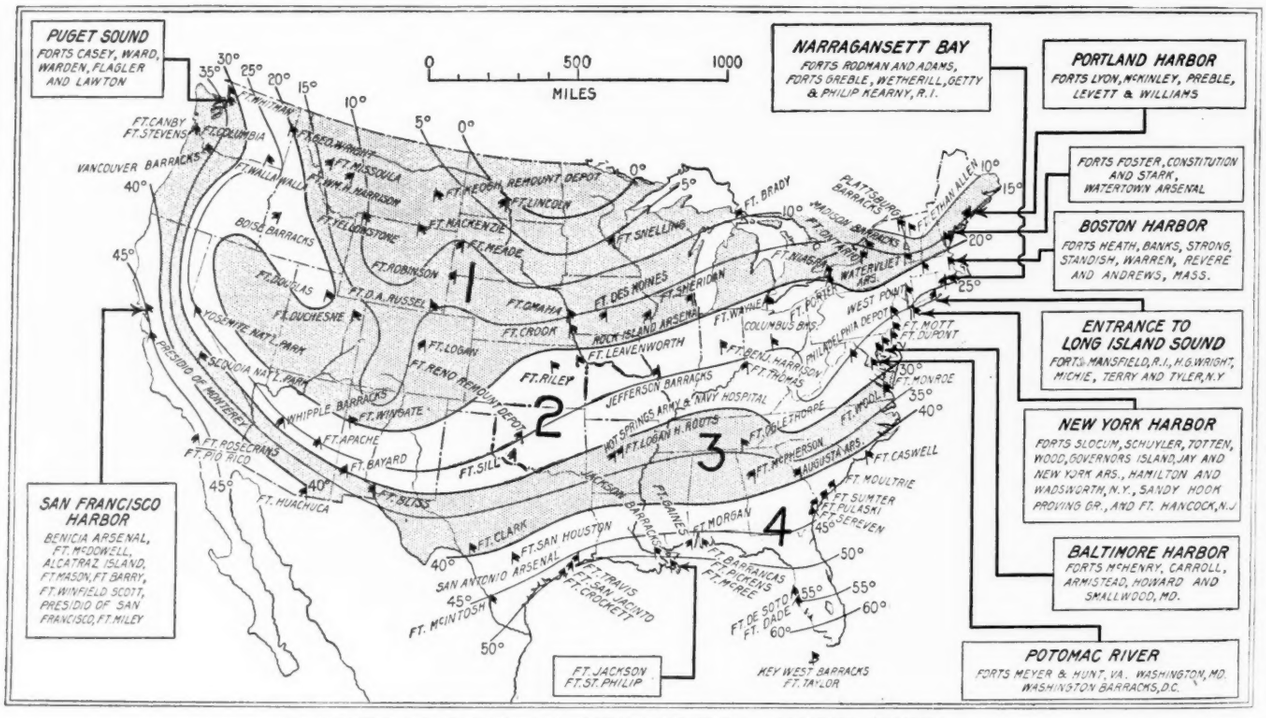
For a long time Uncle Sam was generous with supplies of coal for military use. No scientific means of buying and using it was considered necessary. Officers were entitled to monthly allowances according to the rank they held. A second lieutenant might have an allowance of a ton a month, a captain two tons, a major three tons, a colonel four tons, and so on.

*Fort Casey, Island County, Wash.

Of course the Government knew that it took no more coal to keep a colonel from shivering than a lieutenant, but the difference in allowance was due to the number of rooms that officers of different rank were entitled to have heated at public expense. The troops quartered in barracks were allowed stated amounts, derived from tables of equivalents showing the amount of coal in pounds equal to a cord of standard oak.

But now not only the buying, but the issuing and consumption of coal, have been reduced to a scientific basis. Allowances in all quarters and barracks are now determined by the square feet of grate surface, the size of the rooms in the buildings and other conditions recognized as factors in heating and cooking.

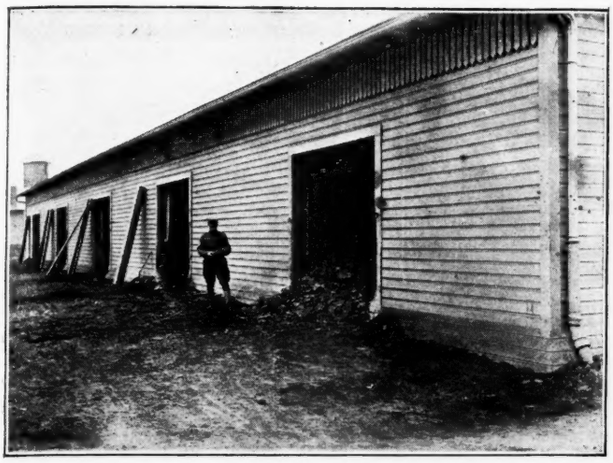
Formerly, when fuel was allowed on a basis of numerical strength of the garrison in men, the amounts allowed were uniform to a great degree throughout the army. Geographical locations did not make any decided difference. Army officers long recognized that there was a wanton waste of fuel because there was no one directly responsible for it after purchase and delivery through the army quartermaster's department.


PUGET SOUND
FORTS CASEY, WARD, WARDEN, FLAGLER AND LAWTON
NARRAGANSETT BAY
FORTS RODMAN AND ADAMS, FORTS GREBLE, WETHERILL, GETTY & PHILIP KEARNY, R.I.
PORTLAND HARBOR
FORTS LYON, McKINLEY, PREBLE, LEVETT & WILLIAMS
FORTS FOSTER, CONSTITUTION AND STARK, WATERTOWN ARSENAL
BOSTON HARBOR
FORTS HEATH, BANKS, STRONG, STANDISH, WARREN, REVERE AND ANDREWS, MASS.
ENTRANCE TO LONG ISLAND SOUND
FORTS MANSFIELD, R.I., H.G. WRIGHT, MICHIE, TERRY AND TYLER, N.Y.
NEW YORK HARBOR
FORTS SLOCUM, SCHUYLER, TOTTEN, WOOD, GOVERNORS ISLAND, JAY AND NEW YORK ARS., HAMILTON AND WADSWORTH, N.Y., SANDY HOOK PROVING GR., AND FT. HANCOCK, N.J.
BALTIMORE HARBOR
FORTS McHENRY, CARROLL, ARMISTEAD, HOWARD AND SMALLWOOD, MD.
POTOMAC RIVER
FORTS MEYER & HUNT, VA. WASHINGTON, MD. WASHINGTON BARRACKS, D.C.
SAN FRANCISCO HARBOR
BENICIA ARSENAL, FT. McDOWELL, ALCATRAZ ISLAND, FT. MASON, FT. BARRY, FT. WINFIELD SCOTT, PRESIDIO OF SAN FRANCISCO, FT. MILEY
0 500 1000
MILES
1
2
3
4
FT. JACKSON
FT. ST. PHILIP
KEY WEST BARRACKS
FT. TAYLOR

ZONES OF EQUAL AND MEAN MINIMUM TEMPERATURE

A Scientific Policy Has Been Adopted

The War Department has just adopted a fixed policy. The first thing it did was to create the rank of fuel overseer in the quartermaster corps. It is the duty of



THE COAL STORAGE AT A THREE-COMPANY POST

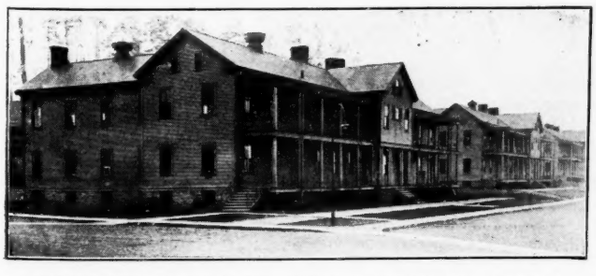
this noncommissioned officer to superintend the delivery, storing, distribution and consumption of all fuel coming into a military garrison. In addition to these duties this soldier is a sort of foreman over all the men in a post who have the firing of heating plants in their charge. His services are designed as much to make a saving in boiler upkeep as to effect economy in the use of coal.

The firemen in the barracks are now required to keep a daily record of the amount of coal used and to record the temperature of the rooms. No such records were formerly kept, and fuel was used indiscriminately. The only vigilance exacted was that the firemen were not to exceed the monthly allowance, and as this was usually generous to a fault, coal was reduced to smoke just for the fun of it.

The fuel overseer keeps records showing the amount of fuel issued to buildings. He must also make daily visits to all firerooms to inspect methods of firing. When he thinks there is an improper use of coal, he is compelled to report it to the commanding officer for remedial action.

The new regulations provide that the use of fuel will be based, first, upon the area in square feet of grate on which the coal is burned; second, on the average outside temperature during the time the coal is burned; third, on a factor which takes into account the human element, or those charged with the operation of heating plants.

An elaborate system of charts has been published by the Government as guides in scientifically heating buildings. There is one set tabulating the temperatures from which a mean temperature for every post has been determined. There is another set known as coal-consumption charts, which have been prepared for various minimum temperatures from plus 40° to minus 40° F. at 10° intervals, and the allowable rate of combustion at any intermediate (average temperature) between 70° F. and the minimum on any chart is directly interpolated. The charts show the allowable coal consumption per square foot of grate area at the several score of posts for steam and hot-water boilers.



SOLDIERS' BARRACKS WHICH REQUIRE LARGE QUANTITIES OF COAL

Assuming that a building is equipped with a Century boiler of 2,200-ft. capacity, with 10½ sq.ft. of grate surface, the allowance of coal according to the proper chart for January would be determined thus: The temperature for the month is shown by the temperature chart as 35°. Interpolating on coal charts at 35°, it will be found that 3 lb. of coal per square foot of grate area per hour is the proper amount to be used. The fuel allowance for the month would then be found as follows: 3 lb. × 24 hr. × 31 days × 10.5 sq.ft. ÷ 2,240 lb. = 10.45 long tons.

DELIVERING CONTRACT COAL AT AN ARMY POST

Where coal at various posts has a different fuel equivalent per cord of standard oak, it is necessary to apply corrections for difference in equivalents. Thus at each post in the service throughout the country the quartermaster must work out the monthly allowance for each building and tabulate it for ready reference. Hence where fuel was once allowed on a basis of rank to individuals it is now allowed to the buildings.

Allowances for hot-water heaters may also be determined from the charts. Allowances are based on the assumption that anthracite and good coking coals are used. Where other coals are employed, corrections of the

amounts must be made in accordance with the instructions for figuring equivalents. Each cooking stove has a definite allowance of coal governed by the type and pattern of the army range in use. One range is allowed 2,500 lb. per month, another 4,500 lb. and a still larger one 6,000 lb.

The charts are most interesting documents. They show temperatures at all posts for many years back. All

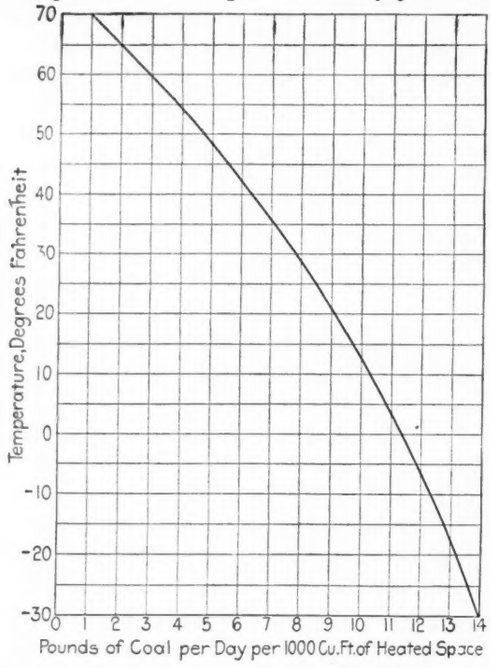


CHART SHOWING FUEL CONSUMPTION PER 1,000 CU.FT. OF HEATED BUILDING

the leading capitals of the world figure in the charts, owing to the fact that the army has military attachés on duty abroad who must be taken care of in the matter of fuel. There is a separate chart for buildings

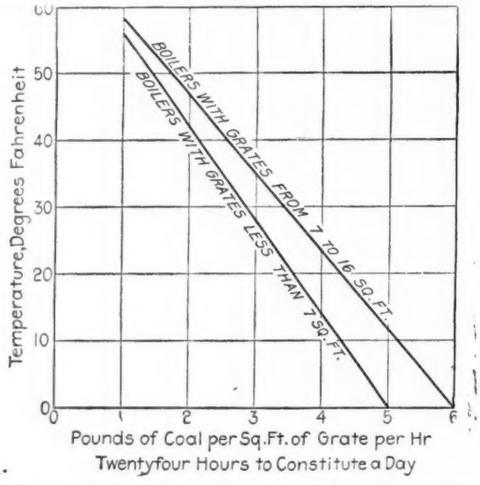


CHART SHOWING ALLOWABLE RATE OF COMBUSTION PER UNIT OF GRATES

equipped only with old-fashioned heating stoves. The zone charts cover every month. One of them is shown herewith.

Uncle Sam has some army posts where coal is burned the year round for heating purposes, and these are within the continental limits of the United States. When humanity is sweltering in summer heat in Eastern centers, the post on Puget Sound has fires going sometimes all day long and always during mornings and evenings. In our tropical possessions, of course, no coal is used at all for heating.

On the other hand it is reasonable to suppose that more fuel is consumed for heating purposes in winter at the posts in Alaska—where little is used in summer—than at Puget Sount posts 12 months in the year. For although the summers are cool and even chilly at times in Washington State, the winters are generally extremely mild.

The army now buys its coal on the B.t.u. basis. Formerly, the fellow who was lowest in price, and who therefore furnished only the cheapest coal, got the contract. Uncle Sam now pays for the heat delivered to him, not a "black substance that looks as though it will burn." Proposals are sent out in the early spring all over the country inviting bids for coal for each fiscal year beginning July 1 and extending to June 30 of the following year. These proposals are sent all bidders on request from the nearest chief quartermaster.

The Eastern Freight Congestion

At the conclusion of a conference of freight-traffic men of the Eastern trunk lines on Dec. 14, these additional embargoes were announced, owing to the continued congestion and the large accumulation of freight:

The New York Central R.R. has embargoed all flour and grain products for export and also lumber and hay consigned for any lighterage deliveries.

The Erie R.R. has embargoed shipments of flour for export requiring "lighterage free" deliveries.

This is in addition to the previous embargo on flour when carried under through export bills of lading.

The Baltimore & Ohio R.R. has placed an embargo on lumber from the South destined to New York for export.

The Central R.R. of New Jersey has embargoed all traffic destined to New York for delivery to coastwise steamers and also traffic to the Pacific Coast for delivery to steamers at New York. Shipments of all classes of freight consigned to Brooklyn terminals have also been embargoed.

The Baltimore & Ohio R.R. on the same day declared an embargo on all grain for export through Baltimore.

At present there are 4,000 carloads of grain at Baltimore awaiting unloading and en route for export, in addition to which the local elevators of the road, having a capacity of 2,500,000 bu., are filled.

The Pennsylvania R.R. has posted the following notice:

Embargo 3,457—Owing to the large accumulation of traffic and to avoid if possible the absolute blockade now impending, embargo all freight, carload and less than carload, including traffic switched from connecting lines, originating at all points, except on the Pennsylvania R.R., P., B. & W. R.R. and W. J. & S. R.R., when consigned, reconsigned or to be reconsigned to New York lighterage, whether export, coastwise or domestic, except dressed meats and other perishable freight, flour and other foodstuffs for local human consumption. Shipments billed up to and including Tuesday, Dec. 14, will be accepted.

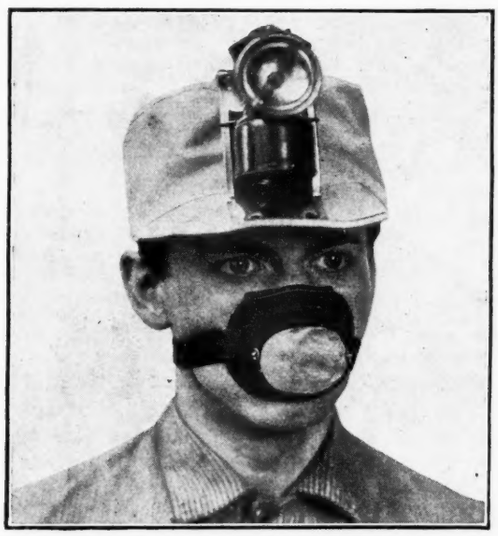
Embargo 3,458—Owing to the large accumulation of traffic and to avoid if possible the absolute blockade now impending, embargo all freight, carload and less than carload, including traffic switched from connecting lines, originating at all points, except on the Pennsylvania R.R., P., B & W. R.R. and W. J. & S. R.R. when consigned, reconsigned or to be reconsigned to Waverly, including Newark and points east thereof, and for connecting lines via junction points east of Waverly, except the N. Y., N. H. & H. R.R. This embargo not to include live stock, dressed meats and other perishable freight, flour and other foodstuffs for human consumption, coal for delivery at Harsimus Cove. N. J., railroad fuel supply coal for any line routed via junction points east of Waverly and coal for public service corporations. Shipments will be accepted billed up to and including Dec. 14.

New Apparatus and Equipment

A New Respirator

Most coal men are uncomfortably familiar with dust, both in the mines and in the tipples and breakers, but worst of all in the crusher rooms and on the yards at coke plants. While it may be an open question just how detrimental to life and health pure coal dust in small quantities may be, there is little doubt that the dense clouds of dust encountered wherever coal is crushed for coke making cannot exert any other than a harmful effect on the lining of the lungs.

It would seem rational to suppose also that the sharp, gritty dust which is unavoidably inhaled by the workmen while watering down and drawing coke from the ovens



THE RESPIRATOR IN USE

exerts an irritating and baneful effect upon the respiratory organs. Such dust is doubtless as detrimental to the health as is the dust from limestone or other rock.

To provide a suitable protection against fine particles of matter of all kinds from entering the lungs and respiratory tract generally, the Multi-Metal Separating Screen Co., 68-72 East 131st St., New York City, has recently placed on the market what it calls its "Pulmosan" respirator. The screening material in this instrument consists of several thicknesses, each capable of arresting the passage of dust of a certain degree of fineness and each supplementing the others in action.

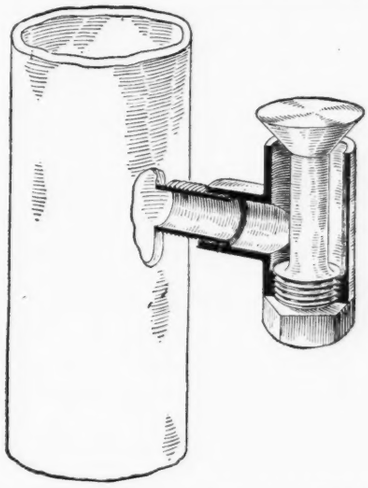
The body of the respirator is made of a soft, pliable material impervious to both air and water and covered with cloth upon each side. The whole instrument weighs but ½ oz. It may be crumpled up and carried in the pocket indefinitely. When wanted it may be removed from the pocket and adjusted to the face and nose almost instantly. It may be washed thoroughly either with or without soap. It fits any face and does not interfere in any way with the wearing of glasses or goggles. It also presents a neat appearance and does not interfere with conversation.

The manufacturer sells these respirators for 50c. each. They have been received with considerable favor in the metal-mining field as well as in numerous manufacturing processes where fine dust of an animal, vegetable, mineral or metallic nature is encountered.

A Fire-Sprinkler Nozzle

A spraying nozzle that is thoroughly efficient and at the same time cheap can be made from a ½-in. tee. The upper part of the tee down to the lower threads is reamed out to a diameter of 1 in. and the upper end is faced off. A plug is made and inserted, as shown in the accompanying illustration. The lower end is threaded to fit the tee. The shank is turned down to ½ in., and the upper end is a cone of about 1½-in. diameter. In order that this cone may be accurately centered in the upper end of the tee, the threads of the lower end are tapped out while the tee is in the chuck for the reaming. If the cone is accurately centered, the spray is evenly distributed over the whole circle.

The amount of water discharged at any pressure depends upon the space between the upper end of the tee and the cone. This is adjusted by screwing the cone in or out, and the adjustment is maintained by a lock nut



THE SPRINKLER NOZZLE IN POSITION

on the lower end of the plug. The pressure governs not only the amount of water discharged, but also the distance to which the spray is thrown.

This nozzle, which is patented, is the invention of Dan Walters, master mechanic at the Hazleton shaft colliery of the Lehigh Valley Coal Co. At the breaker at this colliery 287 of these nozzles have been installed. With the pressure maintained by the pump, they will handle about 3,500 gal. of water per minute and distribute it to every corner of the breaker. They are so arranged that water may be turned into them by pulling a rope on the outside of the building. This makes it almost impossible for anything to interfere with getting water turned into the spray lines and renders the probability of serious fire much

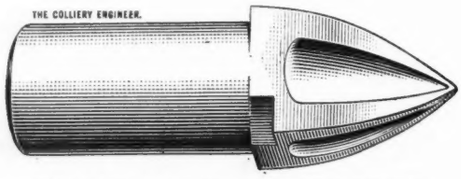
less. The nozzles are tested once a month, and the result is not only the knowledge that the spraying apparatus is in proper working order, but a good washing out is given the breaker.

One of the great advantages of this nozzle, in addition to its cheapness, is the fact that it can be attached to any line large enough to be tapped for a ½-in. tee. All that is necessary is to drill a hole in the pipe and thread it, put in a nipple and attach the nozzle.

Hollow-Ground Crusher Tooth

In order that coal may be broken down in size with the production of the smallest possible amount of undesirable fines, the rolls of the crusher should be provided with sharp teeth. The sharper the teeth the more cracking will be the action and with less of the objectionable crushing; in other words, the less fine sizes and the less power consumption.

Crushing is done best by a tooth having sharp edges, and commonly a square tooth is used. Of course the edges wear off rapidly because they do most of the cutting.



HOLLOW-GROUND CRUSHER TOOTH

Furthermore there is less metal at this point to resist wear, so that a tooth originally square would entirely lose its edges and become round if it were used long enough.

In order to increase the useful life of the crusher tooth, the Wilmot Engineering Co., of Hazleton, makes use of the principle of the hollow-ground tool. The accompanying illustration shows that the middle of each face is depressed so that the edges can be worn away to a considerable extent before they become so dull as to produce too much fine coal and consume too much power.

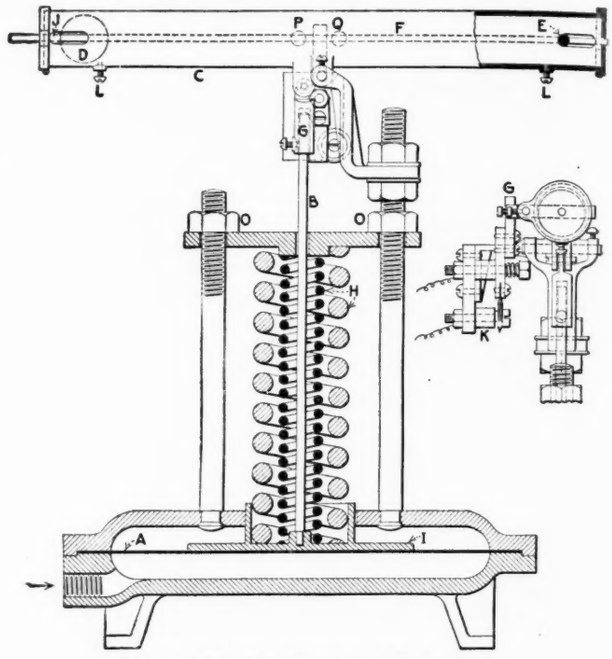
These teeth are drop-forged. They are made from high-carbon steel, so that they last for a long time. They are set in geared rolls running at speeds not greater than the velocity with which the coal drops into the crushing space. Therefore there is practically no pulverization by impact, as is the case with high-speed rolls.

Device for Controlling Pumps

A new device for automatically controlling motor-driven pumps and similar devices for filling tanks, standpipes or other water containers or for ringing signal bells has been recently placed on the market by the Golden-Anderson Valve Specialty Co., of Pittsburgh, Penn. This device automatically maintains within predetermined limits the level of the water in the tanks, standpipes, reservoirs or other containers, and does away with the annoyance of floats or other fixtures.

The pressure from the tank is communicated to the under side of the diaphragm *A* and forces the rod *B* upward, tilting the cylinder *C* and permitting the ball *D* to roll to the opposite end. There it hits the pin *E*, which is attached to the horizontal rod *F*, causing the stop *D* on the rod to move the lever or switch *G*, thus breaking the electrical contact and stopping the motor.

When the water level in the tank is sufficiently lowered the springs *H* force the diaphragm *A* downward. The rod *B*, attached to the diaphragm plate *I*, causes the cylinder *C* to reverse its inclination, allowing the ball *D* to roll to the opposite end, striking the pin *J* which is



CONTROLLING DEVICE FOR PUMPS

attached to the horizontal rod *F*. This causes the stop *Q* on the rod to move the lever or switch *G*, making the contact with the post *K* and starting the motor again.

The setscrews *LL*, shown at each end of the cylinder, are for the purpose of securing different variations of water level in the tank. The adjusting nuts *OO*, above the springs *H*, are for the purpose of obtaining the different heights of water desired in the tank or standpipe.

Coal Resources of North Park in Colorado

North Park, a great natural depression in the Rocky Mountains of northern Colorado, is described in a recent geologic and economic report by A. L. Beekly, of the U. S. Geological Survey, just printed and now being distributed by the Survey as Bulletin 596. The region is far from frequented routes of travel, its remoteness amounting until recent years almost to isolation, so that its geology and its economic resources have remained but very little known. The park includes practically all of Jackson County and is surrounded, except on the north, by mountain walls that rise 2000 to 5000 ft. above the bottom of the basin.

Some of the coal beds are in places very thick, one measuring at one place 66 ft. and at several places more than 50 ft. The coal is sub-bituminous and is remarkably clean. Although the high cost of railway transportation and the higher quality of the coal in neighboring more accessible fields would suggest that the demand for the coal would be practically limited to the park itself, yet the one coal company operating in the park on a commercial scale has marketed considerable tonnage of coal in northeastern Colorado and southern Wyoming.

The Labor Situation

SYNOPSIS—Strike occurs in the anthracite region over the steam use of small coal. Florence and Adrian mines in central Pennsylvania resume operations. The Ebensburg Coal Co. enjoins the union at Nanty Glo. Alexander Howat, one-time union president of the Kansas district, is charged with giving a loving cup to Charles S. Keith. A suit charging $500,000 damages is brought against the union in Arkansas.

The 12 foremen at the Diamond colliery in West Scranton belonging to the Delaware, Lackawanna & Western R.R. coal department, complained recently because No. 2 barley coal was supplied them for firing the boilers. They claimed that more work was occasioned by the small size of the fuel. As it seemed that their demands were unlikely to receive favorable consideration from the company all the men of the colliery to the number of about 1,500 decided to go on strike Dec. 8. On the following day the difficulty was settled after a conference between Arthur C. La Monte, the mining engineer of the company, and John T. Dempsey, district president of the union.

The company agreed to furnish the fireroom with No. 1 barley, a size larger than No. 2. The same number of shifts will be maintained, but if the coal furnished results in the total amount of coal shoveled being reduced 75 per cent. of one man's capacity, one car of No. 2 barley will be used daily, and if the amount shoveled is reduced to 75 per cent. of two men's capacity, two cars of No. 2 barley will be dumped into the boiler room every day. The whole requirement of the plant is three cars per day.

Adrian and Florence Return to Work

The 850 miners of Adrian and Florence in Jefferson County, Pennsylvania, have declared their strike at an end after having been idle since Nov. 22. The miners met in joint session, and on Dec. 9 the Adrian men returned to work. The Florence men were delayed by the condition of the mine till Dec. 11.

In a conference held Dec. 7 between B. M. Clark, attorney for the Rochester & Pittsburgh Coal and Iron Co.; Frank Pardoe, assistant general manager of the same company; James Purcell, district president of district No. 2 of the United Mine Workers of America, and James Marks, a board member of Du Bois, Penn., a compromise satisfactory to all concerned was contrived by the conferring parties.

Injunction Against Union Secured at Nanty Glo

The Ebensburg Coal Co. on Dec. 7 secured an injunction against the United Mine Workers of America for interfering in the operation of the No. 1 mine of Nanty Glo. The affidavit accompanying the petition for an injunction declares that Thomas King, Gazzy Carrol, Armando Pelizarri and several others on Nov. 30 went onto the grounds of the Nanty-Glo Coal Co. and attempted by persuasion and coercion to prevent the men from going to work for the company. The affidavit also states that the petitioners believe that the United Mine Workers of America is paying the moving expenses of some of the employees for the purpose of depriving the company of their services.

The partial strike of the miners employed by W. H. Hughes & Co., at Lilly, Cambria County, Penn., has come to an end after a four-month disagreement. The mines are working about half-time owing to a shortage of cars.

A Loving Cup which Caused Much Heartburning

The libel suit brought by Alexander Howat, ex-president of district 14 of the United Mine Workers of America, against certain persons who alleged that he had received bribes from the Southwestern Coal Operators' Association is still creating much excitement. Joseph H. Hazen, superintendent of the Chapman Coal Co., at Mulberry, Kan., and an agent of the operators testified on Dec. 9 that A. Howat and Fred Holt, the secretary-treasurer of the district union, presented him with a loving cup in September, 1910. Mr. Hazen said the cup was understood as "coming from the union" and was presented after he had paid Howat and Holt $10,000 for their influence in securing a favorable contract with the striking miners. The cup was "for Joe for his help in consummating the contract."

In 1913 rumors began to circulate, and several mine workers came to Hazen's office to see this wonderful loving cup, and Hazen testified that Howat gave $10 to buy a modest substitute with an inscription "Presented to J. H. Hazen for services rendered Chapman Coal Co." This fake cup was to be shown all miners of too inquiring a disposition, but unfortunately there was a photograph of the original loving cup, and worse yet, this photograph appeared in the window of a newspaper office at Pittsburg, Kan. It is not known where the picture came from. Hazen handed the cup to Keith and desired him not to make a photograph of it. In his testimony he said he presumed the cup of love and discord was in Keith's safe.

Despite Alleged Graft Howat Became Penniless

Though Howat was declared to have received large sums of money for his services, it was alleged that in 1914 he was penniless and asked for a loan. This was after the disclosure which followed the filing of the Bache-Denman suit. Howat told Hazen according to the latter's testimony that he did not blame him for his exposure of the bribe in court, but he objected to his saying that Howat received more money than Holt.

Later according to Hazen, Howat was paid $30, and he asked for $1,000 to go to Illinois to get married, agreeing to leave the district for good. Keith refused to give him money, but according to Hazen he promised to give Howat a job in Wyoming.

The Pennsylvania Mining Co. Wants $500,000

The Pennsylvania Mining Co., of Arkansas, with offices at Scranton, Penn., which operates mines at Clarksville, Ark., in Johnson County, filed suit on Dec. 8 against the United Mine Workers of America charging a "national conspiracy to monopolize the coal-mining industry of the United States." The local, district and international officials are sued and recovery of $500,000 damages is sought.

Since the company was organized in 1910, it has been operating "open shop," and the defendants, the company alleges, have frequently attacked the corporation. After the company's workmen went on strike in June and the men joined the union, men who still worked at the plant were assailed by masked men, its pumps and filtration plant being destroyed.

The petition desires the courts to garnishee a large number of coal companies in Arkansas, Oklahoma, Kansas and Texas to hold funds which these companies have collected for the union. John P. White, the president of the international union, and K. C. Adams, national publicity agent, are named among the defendants.

To Re-Establish the Interstate Agreement

An attempt is being made by President J. P. White, of the United Mine Workers of America to restore the interstate scale meeting. He has invited the operators of Ohio, Indiana, Illinois and western Pennsylvania to meet with the mine workers' officials in Indianapolis and discuss the matter. No date has as yet been set. The four-state agreement ended in Chicago about two years ago, the meeting closing without the pact being renewed.

The United Mine Workers have engaged Tomlinson Hall for their mammoth biennial convention which is to last from Jan. 18 to Feb. 4. The Indiana Retail Hardware Dealers were to occupy the room for the week of Jan. 24, but they will now meet in the German House. There will be about 2,000 persons present, and the City of Indianapolis will not be asked to contribute a cent to the entertainment of the delegates.

Recent Legal Decisions

Pollution of Streams in Mining Operations—"To so pollute a stream by mining operations that the waters are impure and unfit for domestic use" of downstream land owners "and from which noxious gases and disagreeable odors arise rendering property used as a residence less comfortable gives a right of action for damages, and this is true regardless of the methods of operation, negligence in such cases not being a necessary predicate to the cause of action." (Alabama Court of Appeals, Yolanda Coal and Coke Co. vs. Pierce, 68 Southern Reporter, 563.)

Right to Eject Intruders—In dismissing a suit brought against a coal company for assault and battery committed by one of its officers in ejecting plaintiff, a discharged employee, from the company's office, the Kentucky Court of Appeals adopted the following rule in the case of Lunsford vs. Hatfield Coal Co., 178 Southwestern Reporter, 1166: "It is the undoubted right of a lawful owner or one claiming title and rightfully in possession or of an occupant of premises to retain possession and to use such force as may be reasonably necessary to remove therefrom trespassers or intruders or persons originally on the premises by license or permission who subsequently create a disturbance or conduct themselves in an improper manner and refuse to desist or leave on request."

Who's Who in Coal Mining

Arthur C. La Monte

Arthur C. La Monte has been a member of the mining department of the Lackawanna R.R. for more than a quarter of a century and is now general manager.

Mr. La Monte was born in East Worcester, N. Y. When he was 14 years old his parents went to Scranton. After graduating from the Scranton high school he was employed by the Central Railroad of New Jersey at the time when it was being built into Scranton. After the work was finished, he was offered an opportunity to continue with the company, but it would have been necessary to leave home so he gave up the work and entered the employ of the D., L. & W. That was 26 years ago.

A position as chainman in the engineering corps was his first job. Feeling the need for more education, Mr.

ARTHUR C. LA MONTE
General Manager of the D., L. & W. mines

La Monte studied at night with the help of E. A. Bartel, who was then assistant chief engineer. Thirteen years later, in 1902, Mr. La Monte himself became assistant chief engineer, and in 1905 he was made chief engineer.

Now, at the age of 46, he takes the place made vacant by the resignation of Col. R. A. Phillips, who is recognized as one of the best of the executives and mining men in the anthracite district. It would be hard to find a record showing fewer changes than that of Mr. La Monte. The Lackawanna has appreciated a good man and treated him well. The promotion was a great surprise to him, but he has earned it, and his associates in the Lackawanna are genuinely pleased by it. He has grown up in engineering work and loves it and leaves it with regret, but the higher officials of the company know that he has the ability to fill the larger position and need him in it.

Mr. La Monte is a past president of the Engineers' Society of Northeastern Pennsylvania and a member of the Peter Williamson Lodge of Masons. For years he has been chairman of the committee in charge of the Railroad Y. M. C. A. in Scranton.

All through the anthracite region he is known as a square man, and no one ever doubts his honesty. He does his best for the Lackawanna, but never at the expense of the public. If there is a little pillar coal somewhere which could be taken out easily, but which is supposed to stay in the ground, the coal stays in. And the Lackawanna has very little trouble with anyone.

Paying the Piper

The anthracite coal miners are now asking a 20 per cent. increase in wages at the next readjustment, doubtless in the expectation of taking on compromise somewhat less. The operators say that this would add 41½c. a ton to the cost of domestic coal. They reach this conclusion by showing that one-fourth their output comes in steam sizes, which must sell in competition with bituminous coal, and so cannot be advanced in price; that one-tenth of the anthracite output goes into operating the mines, and that on the quantity that remains to sell to the forgotten man of everyday life the extra $22,000,000 of payroll would fall. This, the operators believe, would amount in practice to an advance of 50c. a ton in retail prices.

It is an interesting question how far the public is willing to pay for the gratification of its benevolent desire to see wages raised on every hand. When it appeared that these came out of the plutocratic mine owners, that was one thing, but as it is gradually dawning on the public that wages reflect themselves in the cost of commodities, in the threat of six-cent fares, etc., the situation looks different. In earlier times the employer, whether in coal mines or railways, bought labor in the open market at prices determined by the law of supply and demand. The community now decrees the wages.

Whenever a great body of employees go out on a strike, public opinion compels the employer to yield to arbitration whether he could hire other men to take the vacant places or not. And arbitration always comes out the same way. It means an advance, perhaps one-half or one-third as much as the employees ask, but still an advance. And this finds justification in the increased cost of living, due in part to successive advances in wages in other callings. For example, advances in coal costs in recent years undoubtedly furnish an argument for increased wages for our street car and steam railroad operatives. The latter, in their turn, carry scores of commodities upon which the miners depend for livelihood, the prices of which are spiraling upward.

Where are we coming out? The law of supply and demand works automatically, even though with some palpable hardships. Its giving way to wage regulation by public sentiment, as expressed through arbitral boards, raises the possibility of serious complications, not least of which is the likelihood that the more numerous body of employees, because of their greater power over public sentiment, will get better wages, other things being equal, than some less numerous body that may deserve more of their employers. And then, what are the people who sell their wages and products, according to the law of supply and demand, like the farmers and countless small industrial workers, going to say of matching pennies with those whose wages depend on the community's measure of benevolence?—Boston (Mass.) *Morning Herald.*

Editorials

Secretary Garrison and the Army in Colorado

Secretary Garrison in his annual report gives much praise to the action of the regulars in Colorado, as follows:

> Injected in the midst of an inflamed populace lately in open conflict they restored and maintained order. Their poise, justice, absolute impartiality and effectiveness not only applied the proper corrective to the situation on the ground, but commended them to all, whatever the individual sympathies might be, and highly commend them to us. Such a demonstration of the spirit which animates and controls the American army must make every citizen proud thereof.

The army truly showed its efficiency in overriding without violence the rights of the operators. It forbade the opening of mines and the hiring of men. Its poise and effectiveness cannot be denied, but justice and absolute impartiality were so corrupted at their source by the orders of their civil heads that the less said about them the better.

It was decided when the troops entered Colorado that the *status quo* with only violence removed was to be maintained. The mines shut down by union violence should not start operations; the men driven away by the union should remain away while the army was in control. And it was so. Perfect poise and efficiency may be granted, Mr. Garrison, but justice and impartiality are other matters.

The Trend of Conditions on New Coal Contracts

The most important contract news at Philadelphia is the announcement of the new prices by the anthracite companies. Contrary to expectations the leading companies are offering to contract only for the first three months of the new year, but the most surprising feature is that the prices have been increased. The increase amounts only to about the state tax, except on buckwheat, which is considerably more, but consumers were notified that the prices are strictly net, and there will not be any refund of the tax on this coal. It is intimated that this increase has been made to meet the expense of insurance under the compensation law effective Jan. 1.

An advance in the prices seems to have been forecasted by the only contract of any size that was let in this vicinity during the past few weeks—that of the Philadelphia County Prison for 2,000 tons of buckwheat coal (No. 1,637, pp. 870, 959). In this instance the company which formerly had the contract entered a bid at a much higher figure than on the old contract. Other bids were also at high figures, and the contract was finally awarded to a retail dealer, which is something unusual.

The trade is somewhat at a loss to understand why the companies will contract for only three months. In previous years when a wage scale was to be arranged, the usual contracts were entered into except for the addition of a stringent strike clause.

In the face of the new prices the consumers have been somewhat slow to tie up for their supply, even though it is already late in the season. On the other hand the individuals are known to have been in the market for some time with prices at the old figures and are willing to contract for the entire year, with the strike clause of course inserted.

Another item of interest in the contract market is the fact that the City of Philadelphia has not advertised for proposals to supply coal for the various departments. Last year bids were called for on Dec. 6 (No. 22, Vol. 6, p. 933). It may be that on account of the complete change in the administration the bidding on this large contract will be deferred even beyond the end of the year, as has happened on a previous occasion.

The price war on 1916-17 contracts inland from Boston, Providence and other New England distributing points began a month ago to extend to other places where steamers and barges could make deliveries. With almost no publicity and in less than a fortnight a large volume of such business had been closed. Corporations like the Amoskeag Manufacturing Co. (130,000 tons), the Bay State Street Ry. (120,000 tons), the American Sugar Refining Co. (70,000 tons) and F. W. Bird & Son (65,000 tons) bought their coal for the year beginning next April with only a few shippers knowing they were in the market. Only those in the closest personal touch had an opportunity to submit prices. While there is no positive information available, it is understood that most of these contracts were placed at prices well under the figures of early in the year.

Meanwhile the spot market developed rapidly. When water freights advanced to $1.50 to Boston for prompt boats, options were quickly exercised or were withdrawn. No agency is now so keen on closing contracts as a month ago, and the buyers who neglected to accept propositions are in a difficult position. Now that water freights to Boston are $3 or more and all-rail coal is selling up to $2.75 at the mines, new sales in New England are likely to be almost exclusively of a spot character.

The comparatively few bids received by the Central Purchasing Committee at New York for furnishing less than 10,000 tons of anthracite and bituminous coal (No. 1,633, pp. 828, 911 and 959) impressed the city authorities with the fact that coal men are not anxious to tie up on contracts under present conditions. Only 11 bids were received, although about 50 proposals were sent to various dealers who are usually among the bidders for city work. This was due to the fact that the wage agreements in both the anthracite and bituminous regions expire on Apr. 1, and with the present condition of car and labor supply most dealers were not desirous to make contracts. The city will advertise some time this month for sufficient coal to tide over the various departments under the control of the committee until next summer.

Steam contracts awarded in Ohio during the past month have tended toward higher levels. This is espe-

cially true of contracts made by public service and state institutions. Several state contracts were awarded by the Ohio Board of Administration. This board has charge of all the state institutions, and its coal contracts range from 3,000 to 12,000 tons for each institution. In all recent contracts prices for mine-run and slack have been about 5c. a ton higher than during the previous season.

Right To Choose Laborers

It has been said that the Workmen's Compensation Board in Pennsylvania would put three questions to every corporation or individual who seeks exemption from carrying liability insurance. The reply to these questions must state that no discrimination shall be made in favor of unmarried men, young men or foreigners.

It may be well indeed to require the self-insuring individual to promise to take the married with the unmarried, youth with age and the native with the naturalized and newcomers, but whether it is constitutional or even legal is another matter. The courts may well rule that the discretion of the board relates only to the sufficiency of the security and that the action of the commissioners is entirely *ultra vires* when it is applied to the character of the men employed.

Old and feeble men are by the ruling of the board to be given an equal chance to be killed in hazardous occupations with the young and virile. Perhaps later, men with one arm or a game leg must be provided with work in a dangerous location just as freely as men in their prime. Apparently men with weak hearts are to be given jobs which are quite likely to cause that susceptible organ to fail. There is to be no discrimination in favor of the fit.

It is questionable whether this disposition to force round pegs into square holes is really for the advantage of the workingmen. It seems almost certainly unconstitutional and illegal, though as to desirability there may well be two opinions.

Section 305 of Act 338 clearly states that "an employer desiring to be exempt from insuring the whole or any part of his liability for compensation shall make application to the bureau showing his financial ability to pay such compensation, whereupon the bureau, if satisfied of the applicant's financial ability, shall by written order make such exemption."

There is more to the same end, but enough has been quoted to show that the operator can still hire and discharge whom he will, and the bureau cannot say him nay. He can well refuse to answer the three questions which the commissioners are not entitled to ask him.

Conservation and Waste

For many centuries it has been customary to regard the conservation of material as the only form of conservation worthy the name. It is only recently that we have learned to look with solicitude on the waste of labor and laborers. However, we do not yet realize the true importance of productive labor. A few apples fall to the ground and are wasted, and everyone deplores the loss; tons of coal are buried underground, and conservationists bitterly bewail the waste, but we go into the market and find men all the day idle without any regret, though the men thus living without toil not only throw away their own lives, but the large body of material which they consume.

So the industry owes a debt to H. M. Chance for his remarks at the dedication of the Mines Building of the School of Mines of the Pennsylvania State College on Nov. 5, when he pointed out that too many of the conservationists belie their name and promise only to replace a prodigality in the use of material by a far more wasteful prodigality of labor.

But Mr. Chance carried his argument too far when he said that it did not pay to remove all the coal except in longwall work. He went too far when he assumed that the pillars could not be removed in room-and-pillar works without using some artificial substitute, for in some places where 95 per cent. of the coal is recovered, the cost of that conservation is little or nothing.

There is no question but that larger recoveries with economy could be made all over the United States, except in the Pocahontas, Georges Creek, Fairmont and Connellsville regions, where the waste is already negligible. It may be added that in few districts are pillars now left for the purpose of supporting the roof. Pillars are abandoned either because, as mining is conducted, it does not pay to clear the way to them or because it is impossible and unsafe to remove them. The operator does not care if the roof does fall in abandoned rooms, and in most cases he hopes it will, so as to make a squeeze less likely.

The loss in mining is not as great as has been often stated, but most of it is deplorable and not to be defended by any argument of economy. Only where the surface is extremely valuable is a waste of fuel for roof support excusable, and even in those cases it at least calls for an adequate and careful defense.

Coal Mines Need Men

In our Dec. 4 issue we published a short note stating that a number of miners in Texas had expressed to us their desire for aid in effecting a change of employment, or rather a change of location. These men have been working only one or two days a week and find it nearly impossible to live on the income thus afforded them.

Following the publication of this note a number of mining companies in other parts of the United States have both written and telegraphed us, offering employment to any number of worthy miners. This confirms us in the belief that miners in any part of the United States can now find steady employment if they will only look about them. One company in southern West Virginia wires that it can accommodate 10 families at once. The coal seam at this mine averages from 4 to 5 ft.; competent miners can earn from $3 to $4 a day.

An interesting letter from a very large Canadian company says: "We need experienced hand-pick coal miners; also men for shooting and loading coal after mining machines. A number of puncher-machine men are likewise desired. We have steady work all the year round for miners. However, we cannot employ men who are natives of the countries at present at war with Great Britain."

We will be pleased to coöperate with mining companies as well as miners in bringing the right man and job together, thus meeting the large demand for mine labor.

Sociological Department

Dr. August F. Knoefel

Of all the forces tending to promote first aid and good-fellowship in the Middle West stands out most prominently Dr. August F. Knoefel, of Terre Haute, Ind. He is one of the few men who believe that every man and every association of men can be organized for humanitarian work. Not a few of the purposes which induce a man to join a union may be used for the aid of the industry.

A man joins and gives his good money and services to the union because he believes in solidarity or in the seeking of advantages for others while he is laboring for an improvement of his own condition. It is for this same

DR. AUGUST F. KNOEFEL

laudable reason that the miner joins a first-aid association. In fact there is an idealism in both which is of like, if not equal, value. There are two ways of looking at the union—as a mutual association of the men or as a dissension with the operators.

But Doctor Knoefel looks at the existence of the union as a recognition of a social duty, and as a result he believes that the union man as a member of the union can well be brought to foster first aid.

Little by little the miners are beginning to see that their view and the operators' view that union means dissension with the operator is a delusion wherever the collective bargainers are reasonable. Of course they are not always gifted with reason and the differences are not always easy to determine. But still there is always the possibility that the union will be what its name implies and not merely an instrument of aggression.

Dr. August F. Knoefel, formerly chief surgeon for the Vandalia Coal Co., was the third president of the American Mine Safety Association, replacing John P. Reese, a man who had a quite similar viewpoint. The entry of the association as a body into the National Safety Council as the mining section involved a reconstruction in which H. M. Wilson became chairman, H. M. Wolflin, secretary, and B. F. Tillson, Harry Davis and W. A. Luce, vice-presidents, but nevertheless Dr. A. F. Knoefel and John P. Reese remain the leading figures in the Middle West, where their helpful certainty in the excellence of people in general enables them to aid in inducing the unions to take a leading part in first-aid activity.

Old Company Prize Scholarship

The Lehigh Coal and Navigation Co. has offered a scholarship in Lehigh University as a prize to that student in its schools who shall pass the entrance examination to Lehigh with the highest grade. The prize was announced at the annual banquet of the Panther Valley Mining Institute last October, and there are 18 contestants now preparing themselves for the examination. It is the plan of the company to expend about $350 per year for the full period of four years, so the prize is well worth striving for.

The institute school for the present year has an enrollment of 239, with an average attendance of 162. The classes, with the number of students in each, are as follows:

Subject	Enrollment	Average Attendance per Month
Scholarship	18	18
Mining	30	16
Mechanics	23	19
Electricity—		
Beginning	41	26
Advanced	6	5
Primary	85	53
English	36	25
	239	162

Last year the enrollment was 175, and the attendance fell off considerably toward the end of the year. The reason for this is interesting. It was not owing to dissatisfaction or failure to progress, but to the fact that a considerable number of scholars in the primary and English classes thought that they had learned all that was necessary when they could read fairly well and solve some simple problems in arithmetic.

In the class in mining care is taken to instruct the students in practical subjects. The certificate given at the end of this course shows that the student has passed an examination equivalent to the mine foreman's examination. The success of the work is well demonstrated by the fact that no student who has completed the mining course and then taken the state examination for mine foreman has failed to pass.

The students are all employees of the Lehigh Coal and Navigation Co. Membership in the institute costs $1 per year, and this includes the banquet, which is alone worth more than the subscription paid. The only expense to students is that for books furnished at cost. The total expense for a course is never more than $2.

Discussion by Readers

Output of British Coal Mines

Letter No. 1—My attention was drawn recently to the editorial relating to the output of British mines, as referred to in a paper read before the North of England Institute of Mining Engineers by Samuel Dean, an Englishman now engaged in coal mining in this country. Permit me to say that many of the statements made, *Coal Age*, Nov. 6, p. 762, are, I believe, misleading.

Having spent 30 years of my life in the coal mines of South Wales, having performed almost every class of work, including the management of mines, and feeling that I understand most of the conditions that control the output of English mines, I beg to refer to a few of the conditions that must be considered in this connection.

Difficulties Encountered in Welsh Mines

The coal mines of Great Britain have generally a larger quantity of firedamp generated in the workings than the mines of this country. On this account, most of the mines here can use electric mining machines for cutting the coal, while the mining law of Great Britain prohibits the use of electricity in coal mines beyond the bottom of the downcast shaft.

Again, with respect to blasting the coal, the mining law of Great Britain expressly prohibits the use of powder in dry and dusty mines. It stands to reason that where it is possible to blast down the coal with powder, as in most mines in this country, a larger quantity of coal can be mined per man per day than where the coal must be brought down with wedges and hammers.

Again, coal is mined at a greater depth in Great Britain than in this country, and this causes a greater roof and side pressure in all rooms and entries. If the same difficulty were encountered in maintaining the roads, aircourses and rooms here as in Great Britain, many of the mines in this country now being worked would be obliged to shut down owing to the extra expense incurred in their operation. The cost of upkeep or maintenance of roads in Welsh mines is greater than that in any other mines in the world, as every coal digger in the mines of South Wales has a dayhand. Under such conditions, an output of 1 ton per man per day is considered good, and it is often not more than three-fourths of a ton per man. Also, owing to the great depth of the coal below the surface, the cost of sinking is much greater in Great Britain than in this country. Moreover, the mining law there compels the operator to line his shaft with brick.

Equipment of Mines Uptodate

Regarding equipment, there are mines in South Wales that will compare favorably with any in the world. Some of the mines put out 4,000 tons of coal in 8 hr. With regard to the capacity of railroad cars in Great Britain, this varies from 7 to 20 tons. Such cars were built eight years ago when it was found that larger cars would not suit the conditions in the mountainous country of that section, where the track curves are often very sharp. The capacity of the mine cars used underground varies from 3,000 to 4,000 lb., which shows that they are not such small cars after all.

In some of the mines there are coal seams not more than 2½ ft. thick, and in a few instances the thickness of the coal does not exceed 2 ft. In these mines the roof is taken down so as to give sufficient height for the horses to take the cars to the face of each room. In the Clydach Vale mine, owned by D. A. Thomas, who is at present in this country as agent for his government, horses are employed that measure from 14 to 18 hands high. Some of these animals cost from $300 to $500 each. The fact that they take the cars to the face of each room shows that much work is done to maintain sufficient headroom on the roads. An inspector is employed by the company to see that this is done, and where there are marks showing that the horse rubs against the roof, the place is stopped until this can be remedied. From this description, I think it will be easy to see that British mines have no "pigmy equipment."

Attitude of Miners' Union

Speaking of the attitude of the miners' union in Great Britain, the article defines it as "false political economy," which reference I fail to understand. If the miners claimed an advance in proportion to the selling price and because of the high cost of living, in my opinion it was justified. Welsh coal has been sold at $4.80 to $5.28 per ton during the last five years, and the highest price paid for mining will hardly reach 75c. per ton. Coal operators, in this country, would be glad of such a margin.

Reference is also made to the mines of Great Britain as being "extremely warm and enervating." But this is the effect of natural conditions. I have seen gobs in these mines so warm that one could not hold his hand on the stone, and an air current of 20,000 cu.ft. per min. was passing the place. All of these conditions must be considered when comparing coal mining in Great Britain with that in this country.

William James.

Mystic, Iowa.

Fluctuation in Price of Coal for Different Grades

Referring to the editorial entitled, "Why Different Grades of Coal Fluctuate Independently," *Coal Age*, Nov. 27, p. 890, I desire to draw attention to the third paragraph of the article, in which it is stated that the demand for the small sizes of anthracite depends only on "past use and the type of boiler-furnace grates already installed."

This statement would make it appear that if a concern has a boiler plant so equipped as to burn small anthracite, it does not care to change and use soft coal merely because its boilers are so equipped. This seems hardly to be the case. If there are sufficient advantages for changing over from small anthracite to soft coal,

merely the fact that the boilers are equipped to burn hard coal will not deter many from making such a change, especially since it would not be very expensive to equip their boilers to burn the soft coal instead. It is no uncommon occurrence for a concern to remove grates that have been in use but a short time in order to replace them with proper grates and blowers to burn small anthracite and so effect the resulting economy.

Surely "past use" does not incline a concern to continue to burn small anthracite unless other valid and weighty reasons exist. There are today thousands of concerns burning small anthracite, and they are doing so in possibly 99 per cent. of the cases because they find it economical, not because they had been doing so in the past. Is it not a fact that the use of small anthracite has been increasing and not decreasing? That certainly would not be the case if it were merely "past use" that is causing plants to continue its use.

The Question of Confidence

Again, the editorial states that "once the trick is turned he (the plant owner) will feel a confidence that will make it difficult for the hard-coal salesman thereafter to reconvert him to the use of an anthracite fuel." Why? Why does the use of soft coal necessarily insure this "confidence"? There are plants operating today in all sizes from 100 hp. up into the thousands and burning small anthracite. They do not lack confidence in any degree, nor is there any reason why they should.

This paragraph in the article would almost seem to be a brief for soft coal, though I am sure that you had no such intention in writing it. Nevertheless the article is distinctly unfavorable, not only to anthracite mine operators and coal companies, but also to all concerns whose business is more or less directly affected by the sale of anthracite. Surely you do not, on second consideration, believe such a statement as the following, which I quote from this article: "Such customers once lost might not be regained even if the price of the anthracite fuel were much reduced." There are not a few concerns that used anthracite and changed over to soft coal, but have again come back to hard coal,-even without a price reduction. There are no doubt others that have changed to soft coal because of changes in price who would gladly and immediately go back to hard coal if the price of the latter were again reduced.

I shall be glad to have your further comments on this matter, if you feel that this is warranted.

New York City. V. H. Carples.

Responsibility of Miners

Letter No. 4—I was much impressed in the reading of Letter No. 2 by John Majer, *Coal Age,* Nov. 13, p. 814. I can heartily indorse all that he has said on the subject of the responsibility that rests with the miner when he goes into the mine.

Mr. Majer remarks, "Miners suffer more as a result of these enforced periods of idleness than the coal operators themselves." That statement is too true; there are thousands of miners throughout this and other states who can testify to that fact from their own experience. When the mines shut down last spring, many miners had to hunt work elsewhere, and some of them are still looking for places. Many have left the union fields of Ohio and have gone to the nonunion fields of West Virginia and Kentucky in the hope of finding employment that will give their families the necessaries of life.

Speaking of miners suffering in periods of idleness more than the mine operators calls to mind a little incident that happened the other night. We had just finished supper when there came a knock at the door. A man stood outside asking for something to eat. While my wife was preparing it, in response to my question he said that he came from Ohio, where he had worked for the Sunday Creek Co. until the big strike that closed the mines. He said that he had a wife and five children, and when the miners' aid ceased, he was obliged to hunt for work elsewhere. Now, with winter approaching, he had no job, no clothes and perhaps his wife and children were starving at home.

I took the man to the mine manager (foreman), who opened his heart and promised to start him to work in the morning. The man looked like a good miner, and I believe he will stick to his work. This incident, which is but one in many, shows clearly who suffer the most by such periods of idleness for which the miner, as an individual, is in no way responsible.

Miners Take Chances Needlessly

The miner is responsible, however, for his conduct in the mine. I believe every man in a measure is as responsible for the safety of his fellow worker as for the care and protection of his own family. As a class, miners are reckless men who take many chances when there is no need of their so doing. I have heard it argued that it is useless to attempt to stop these reckless habits, but in my opinion they can be stopped by giving these men a broader education relating to work and conditions in the mine. It may be a slow process, but eventually every miner will come to realize the danger of crossing over an examiner's (fireboss') mark or failing to set a post under a loose rock, and many similar things that today the miner chances. I hope this discussion will continue until some good is accomplished and every miner is impressed with his individual responsibility.

Eldorado, Ill. Ostel Bullock.

Store Checks vs. Thrift

Letter No. 8—I have been reading with great interest the letters relating to the store-check system. It is all very well for the industrious miner who cares for his wife and little ones to say that he has no use for the store-check system in company stores. Why? Because he has a few dollars laid away that he can use in time of need.

There is another side to this question, however, as we have a different class of miners to deal with and they are not few in number. I refer to the man who spends at least one week's pay on pay night, perhaps all his pay, and what is left for his wife is a brutal answer or a kick.

A Personal Experience

My own experience, briefly told, may serve to emphasize my claim that the store-check system is the only proper method of conducting a company store today. I am a miner 31 years old and have worked 21 years in the

mines. Why? Because my father worked in the mine and brought me up to do the same. I am sorry to say that my father drew his pay in cash every payday and spent practically all his earnings instead of bringing the money home. The first payment was always made to the saloon, as father regarded this the most important. There might be two or three saloons, but all must have their pay on pay night, which was ended in a drunk. This would be followed the next day by many friends eager to drink the health of any man with a few coins in his pocket. Then came the sad story of who is to pay the store bill and the butcher, and this burden fell heavily on the wife and mother.

I recall that many a time mother would say, "Fred, you will have to wait this time for your shoes, the store must be paid." Is it strange that this experience compels me to say that the store-check system, with all its faults, is far better than the cash system, as it protects the wife and mother of a family and permits her to obtain the necessities of life, while at the same time it brings the drunken miner to his senses. The wife can go to the store, buy what goods she needs on the store-check system, and the husband gets a blank on payday. While the system thus gives the needed protection where it is necessary, it imposes no burden on the man who trusts and is trusted by his wife and family.

Practical Working of Store-Check System

To conclude this unhappy recital and clinch my argument, permit me to say that since being married, I have worked in a different mine and can buy at three different stores. The mine in which my father now works, I am glad to say, has a company store—one of the leading stores in town. On payday he draws a blank and as a result is in bed at 8 o'clock every pay night. If he is to get a glass of beer, he must beg the nickel from mother. I will say that the company store has saved my father, who would have been dead years ago but for the store-check system. If mother wants a pair of shoes, she can get them at the store. She has not been able to put much money in the bank, but it is great to know that the butcher and the store bills are paid regularly.

In closing, I want to say that the store-check system is a godsend to many miners' wives. Instead of doing away with this system, take away the saloons, and miners will have a better chance to make good. H.

——, Penn.

Letter No. 9—The discussion of the question of store checks versus thrift, growing out of the Foreword in *Coal Age*, Oct. 16, increases in interest. In answering the question whether the company store-check system is an evil and operates against thrift in the miner or whether it is a help to him in some instances, I speak from the standpoint of my own experience and observation as a miner.

My opinion is that it is an evil only to that class of miners who have misused the privilege, but to the average miner it has been helpful. The lack of forethought and of the exercise of economy and frugality in his own affairs is a greater obstruction to thrift in the miner than the store-check system. My observation has convinced me that the miner who objects to that system most is generally the one who, by reckless and improvident living, is forced to trade wholly at the company store because he cannot get credit at other stores and never has any money.

Extravagance Among Miners

I have known miners who made more than a hundred dollars a month and yet, with average families only, never drew a dollar in cash on payday, having exhausted all their wages in store checks. I have known other miners working in the same mine and earning the same amount, with about the same families to support, who used no store checks, but drew the cash payday. Before the next payday came around, however, the money was all gone, and there was nothing to show for it. It may be argued that these are extreme cases, but they are to be found nevertheless. Unfortunately miners of this class seem to have been born improvident. They have no management or forethought in regard to their financial affairs. They save no more money and apparently have no more comforts when earning a hundred dollars a month than when earning half that sum.

From the standpoint of thrift neither of these classes of miners seems to have the advantage of the other. But surely the reckless and injudicious management of the latter class cannot be attributed in any way to the store-check system. I have known other miners who managed their work poorly in the mines and could not make above fifty or sixty dollars a month, but who drew what store checks they needed, lived frugally and saved money enough to buy homes. Store checks did not operate against these miners. The miner who is thoughtful and economizing in his affairs, however, is not always the best and most reliable worker, as has been intimated. Some thriftless miners are willing and hard workers and always ready to go where needed. Many of them have good judgment about work and consequently make more money under the same conditions than the miner with more thrift, but they do not have the same ability to use their earnings to advantage.

Thrift Means Responsibility

The question has been asked, "Isn't thrift worth more than store checks?" Certainly it is, wherever it can be taught. But there are miners who have been in the mines for years and still have no conception of thrift or economy and seemingly never will have. They do not want thrift, for the reason that it carries with it the responsibility of thought, purpose and management.

For illustration: The general manager of a company where I once worked built for one of his employees a nice three-room house, which was to be paid for by the month at about the rate of the rent. When the amount was about half paid, this employee wanted the general manager to take back the house and return him the money paid, which, of course, the general manager would not do, but encouraged and insisted on his finishing payment and having a home of his own. The employee finally made all his payments and received a deed to the property. He then sold it for less than cost and quit work until the money was all gone and he was back where he was before. Several years have passed since this incident occurred and this man is without a home or a dollar in his pocket. Like many others he does not want to be burdened with owning a home.

In conclusion I will say that in my opinion the store-check system and the average company store, as conducted in this mining section, are not evils working against either the thrifty or the improvident miner. For illustration: Owing to the dull demand for coal, together with close competition and disadvantages in transportation facilities, many mines have not been operated steadily during the past months. And many of these, even when operated in connection with a store, have yielded only small profits, if any. Many would not have been operated at all but for the store. Working in many instances less than half time, many miners were compelled to spend in the store all they made. Without this half-time work, which they would not have had but for the store assisting the mine and with nowhere to go to better their condition, may I ask, Is not the company store more a blessing to the miner than an evil? Ask the thoughtful, industrious miner for his opinion in regard to the store and the store-check system.

JOHN ROSE,
Dayton, Tenn. Former District Mine Inspector.

A Flooded-Mine Proposition

Letter No. 4—Referring to the inquiry relating to the flooding of a mine as described and illustrated on page 646 of *Coal Age*, Oct. 16, I want to suggest the following procedure:

Advance the pumps with the unwatering of the places to near the face of room No. 4, where the machine cut through into the old workings. This will reduce the actual suction length or the distance the pumps must draw water. When the water has been sufficiently reduced pile sacks of sand along the face and in the undercut, close up to the machine, so as to cut off the flow of water as much as possible. Now, having extra sacks of sand ready and all preparations being made, quickly pull the machine back and block the opening with sand bags to stop the flow of water as much as possible. Most of this work, of course, must be done in the water accumulated at the face.

Then, proceed to build a dam of sand bags about 5 ft. back from the face, forming a semicircle about the cut, and build this, say a foot or 18 in. in height. Make the dam tight by plugging the inner faces of the bags with clay. When this is completed, it will be possible to construct a permanent bulkhead across room No. 4 about in line with the face of room No. 5. I think it will be safe to erect the bulkhead at this point, since practically 5½ ft. of barrier coal held back the body of water previous to the machine cutting through the pillar. Shallow trenches should be cut in the roof and the floor, of the same width or thickness as the bulkhead and extending across room No. 4, also in the ribs on each side, so as to form a good bearing for the bulkhead. The bottom will perhaps require the most careful attention, owing to its being softened by the action of the water and this bottom trench should be deep enough to reach solid formation.

From the statement of the question, I do not believe that the head of water, in this case, is 100 ft. The inquiry states that the inflow of water ranges from 700 to 800 gal. per min. Say it is 748 gal. or 100 cu.ft. per min. Assuming that the hole broken through is 3x4 in. or, say, $\frac{1}{12}$ of a square foot, if the flow is 100 cu.ft. per min., the velocity of the water will be 1200 ft. per min. or 20 ft. per sec., which would show the head to be

$$v = \sqrt{2gh} = 8\sqrt{h}$$

and

$$h = \left(\frac{v}{8}\right)^2 = \left(\frac{20}{8}\right)^2 = 2.5^2 = 6.25\ ft.$$

In other words, the abandoned workings are, perhaps, filled with water over a considerable area, but the water probably has a comparatively small head. It is possible to calculate, under these conditions, the exact pressure of the water on a bulkhead or dam constructed at the face of room No. 4; but this will hardly be necessary in the present case. I would suggest the building of a reinforced concrete dam or bulkhead across the face of room No. 4 as previously stated. I estimate the horizontal pressure against a section of this dam 1 ft. wide and, say, 6¼ ft. high, under the estimated head, to be 1,218 lb.

The Pocket Companion of the Carnegie Steel Co. gives, for this pressure and a span of 4.5 ft., a slab 6 in. thick containing an area of steel reinforcement of 0.18 sq.in. per ft. of width. In triangle mesh, style No. 41, consisting of $\frac{7}{16}$-in. cold-twisted square bars, one every foot of width will be sufficient. Then allowing a factor of safety of 5 to cover unknown conditions, the slab or bulkhead in this case should be 10 in. thick, with 0.7 sq.in. of steel area reinforcement. This would require $\frac{3}{4}$-in. cold-twisted square bars, placed 1½ in. from the outer face of the dam and one bar per foot of width.

A. W. HESSE, General Manager,
Lincoln Coal Mining Corporation.
Big Creek, W. Va.

The Coal Age Pocket Book

There has been such a demand for the early publication in book form of the pages that have appeared in *Coal Age* each week under the title, "Study Course in Coal Mining," and so many inquiries have been received in regard to the ultimate scope of the work that it has been decided to issue in January, 1916, three sections of the book, which will be known as "The Coal Age Pocket Book."

The matter has been prepared by J. T. Beard, of the *Coal Age* staff of editors, and is not a compilation of other publications, the subjects being treated originally and independently with a view to eliminating extraneous matter and presenting in a simple, concise form only what is essential in the study of the subjects relating to coal mining.

One of the prominent features throughout the book is the unification of standards and constants commonly used in engineering, the derivation of which is shown, as far as practicable, for the assistance of those who desire to study the rudiments of each subject treated. The book is written as an aid to study and combines matter needful for the beginner and valuable to the engineer.

The present publication will include sections on arithmetic and mensuration, including logarithms, geometry and trigonometry, mine gases and ventilation. The pages in each section will be numbered independently to permit extension in later editions as each subject is amplified. It is a book that even in its present incomplete form will prove a helpful companion to every mine manager, superintendent, foreman, assistant foreman and fireboss—a valuable reference book for engineers and a simple and instructive textbook for beginners.

Inquiries of General Interest

Coal Salesmanship

As one interested in the sale of coal, I would like to ask, What should constitute the actual ability of a man employed in the sales department of a large coal company? In other words, what must be the qualifications of a man able to sell coal; what must he know?

Is this knowledge to be obtained from books or from experience in the actual mining of coal? Are there any books published on this subject that would help me? I am getting my experience underground, but hope some day to get into the sales department, and I desire to fit myself in every way possible for the work that will be required. R. J. LAUDER.

Emeigh, Penn.

A good salesman in any branch of industry must be possessed of many qualifications. It is important that he should know thoroughly the article he has to sell. This knowledge must include not only the qualities of the article or substance, its source of production, details of handling, storage and manufacture, but also its application to practice and adaptation to different conditions with respect to the purpose for which it is intended. He must be well informed of its present market value and the competition that must be met and overcome in its sale.

Aside from this knowledge, a salesman must have a good address. He must be a fair judge of human nature, optimistic and not easily discouraged. He must use judgment in approaching a customer and display tact in announcing his errand and presenting his business. A man cannot sell to advantage an article with which he is not fully acquainted; but even with this knowledge, his success in securing a good order will depend largely on his knowledge of men and the judgment and tact he displays in the transaction.

A good salesman will recognize that there are times when it is more important to win the esteem and confidence of the man he approaches than to sell him a bill of goods or take his order for a car of coal. He must know the need and be quick to detect the varying inclination of his customer, humor his whims and be interested in his hobby if he has one. By such tactics, an ingenuous salesman will often secure an order where more direct methods would fail. A good salesman, however, will not lead a customer by such methods to order goods he does not need, as the results that are likely to follow will prove as disastrous to the one as to the other of the two parties.

In regard to the preparation for salesmanship, we recommend a practical apprenticeship, which alone can give the necessary experience that will make a successful salesman. Study every feature of the industry. To sell coal, one should know by experience every detail connected with the mining, haulage and loading of the coal at the mine and its transportation to market. Most of this knowledge must be gained underground. He should then become thoroughly acquainted with the business methods in the office of the sales department.

Much can be gained by the study of means and methods, as described from time to time in *System,* A. W. Shaw, publisher, Chicago, Ill. A salesman can secure many good points in respect to advertising features that cannot but be helpful to him by reading the small weekly publication known as *Printers' Ink,* published at 12 West 31st St., New York City.

In the preparation for salesmanship there is much helpful information to be obtained from a book entitled "The Art of Selling," by Arthur Frederick Sheldon. The book is published by the Sheldon University Press, Libertyville, Ill., price $1.25. Another book entitled "Scientific Sales Management," by Charles W. Hoyt, price $2, gives some valuable information in the management of sales departments.

Tripping of a Circuit Breaker

I would greatly appreciate an explanation of the following trouble: In our mine, when a short-circuit is caused by locomotives or mining machines, it knocks the circuit breaker at the pump motor, should this be running at the time. The result is a big flash, and the commutator of the motor is blistered. At the same time, the circuit breaker in the power plant is tripped, causing a big flash and blistering the commutator of the dynamo. N. JOHNS.

Beccaria, Penn.

When a short-circuit occurs on a power line, whether this is owing to the haulage locomotives, mining machines or other cause, the result is a drop of voltage over the entire line, owing to the greater rush of current caused by the short-circuit. There may be two cases to be considered: (1) The circuit breaker may be equipped only with an overload release. (2) The circuit breaker may be equipped with a low-voltage release. In the first case, when the short-circuit occurs, resulting in a great rush of current and a drop of voltage, there is produced sparking at the commutator or a big flash accompanied, it may be, by the "pitting" of the commutator. This is not, properly speaking, a "blister," as described by the correspondent, although it may somewhat resemble it in appearance. The sparking or flash is at once followed by the tripping of the circuit breaker.

The same series of events takes place at the pump motor. There is a big flash accompanied by the sparking or pitting of the commutator and the tripping of the circuit breaker simultaneously with the occurrence in the power plant.

This result should not occur, however, if the circuit breakers are equipped with a low-voltage release. In that case, when the short-circuit occurs on the line, the drop of voltage that immediately follows will trip the circuit breakers and prevent the rush of current that would otherwise damage the commutators.

Examination Questions

Tennessee Examination Held at Knoxville, Nov. 23-25, 1915

(Selected Questions)

Ques.—Why is the dust from some coals more dangerous than others?

Ans.—Because of its greater fineness and inflammability, owing to the physical character of the coal and its chemical composition. The fineness of the dust marks the ease with which it is held in suspension in the mine air, in which condition it is more readily acted upon by the flame of a shot or burning gas. Again, some coals contain more bituminous matter and volatile combustible, which render them more highly inflammable than a coal containing less of these constituents. Also, some coals absorb a larger amount of oxygen from the atmosphere, which increases their inflammability.

Ques.—Where are explosions from coal dust most likely to occur?

Ans.—Explosions of coal dust are more likely to originate in proximity to the coal face, especially where mining machines are employed to cut the coal. The reason for this is the greater accumulation of fine dust and the greater emission of gas from the freshly cut coal at the face, in addition to the presence of flame incident to blasting the coal or the possible occurrence of a blownout shot. All these conditions are important features in the origin of a dust explosion.

Ques.—What are the chief factors of danger in coal mines?

Ans.—The chief factors of danger in the operation of coal mines are the liability of injury from falling roof or coal, the ignition of gas or dust, movement of cars, shock from electric wires, the possibility of being overcome by breathing gas or air devoid of sufficient oxygen for the support of life.

Ques.—How does carbonic-acid gas (carbon dioxide) affect the human system?

Ans.—Carbon dioxide is not commonly considered a poisonous gas, but it has nevertheless a distinct toxic effect on the system that is extremely dangerous. The presence of this gas in the air breathed not only reduces the percentage of oxygen below the normal, but its absorption by the blood seriously interferes with the power or capacity of the blood to absorb and carry out of the system the carbon dioxide produced in the tissues of the body as a result of the oxygen conveyed to them by the blood.

It must be remembered that the blood performs a double function—conveying the oxygen breathed into the lungs to the tissues of the body, and removing therefrom the carbon dioxide produced by the combustion going on throughout the body. The effect of carbon dioxide in the air breathed is therefore to derange the human system, first causing headache, then pains in the back and limbs, followed by nausea, prostration and finally death by suffocation when a sufficient portion of this gas is present in the air.

Ques.—How would you ascertain the number of cubic feet of gas standing in an entry?

Ans.—This question must be answered from the standpoint of mining practice rather than in its literal sense. Gas generated at the head of an entry, a few feet in advance of the last breakthrough or crosscut where the air current is passing, has a tendency to accumulate in greater or less proportion at the face of the entry. The percentage of gas in the mine air under these conditions diminishes gradually from the roof to the floor and from the face of the coal outby to the crosscut.

In mining practice what is called "gas" is such a percentage of marsh gas present in the air as will form a cap on the flame of a lamp used for testing. It is customary, therefore, to raise the lamp cautiously toward the roof and note the point at which the cap first appears on the flame of the lamp. If this occurs at 6, 8 or 10 in. from the roof, there is said to be 6, 8 or 10 in. of gas. It may be possible to approach and measure the gas nearer the face of the entry, but as a rule the movement of the person toward the face will disturb the gas so that it is practically impossible to measure with any accuracy the so-called volume of gas accumulated in the entry. The miner, however, reports so many inches of gas, and its volume is estimated by multiplying this number of inches by the width of the entry and that product by the distance from the face to where the gas is found or measured, and reducing this volume to cubic feet.

Ques.—What sources contribute to the heavy loss of coal in mines?

Ans.—The causes of loss of coal in mining are numerous. Probably the lack of a definite plan in the laying out of the mine is the primary cause of the greatest loss of coal in the later development. The failure to adopt a sufficient width of pillar on the main and cross entries and to proportion the width of room pillars to the size of opening, depth of cover, nature of roof, floor and coal, thickness and inclination of the seam, etc., causes great loss in working the coal. The tendency of miners to rob the pillars in the first working causes the loss of much pillar coal when bringing back the pillars. The irregular working of the rooms along a single entry results in some rooms advancing more rapidly than others, which produces a broken line at the face of the coal and brings undue pressure on some of the room pillars, crushing them and increasing the loss of coal in drawing back the pillars.

Ques.—If 15,000 cu.ft. of air and gas at its highest explosive point is passing through a mine what is the quantity of gas given off? What quantity of air must be added to render this current nonexplosive?

Ans.—A mixture of air and marsh gas at its highest explosive point contains 9.46 per cent. of gas; hence the volume of gas given off is $15{,}000 \times 0.0946 = 1{,}419$ cu.ft. per min. The volume of air and gas when this is, say a 2-per cent. mixture is $1{,}419 \div 0.02 = 70{,}950$ cu.ft. and the volume of air to be added is therefore $70{,}950 - 15{,}000 = 55{,}950$ cu.ft. per min.

Book Reviews

Text Book on Assaying

A TEXTBOOK OF PRACTICAL ASSAYING FOR THE USE OF MINING SCHOOLS, MINERS AND METALLURGISTS. By James Park, professor of mining, Otago Universiity, director of the Otago University School of Mines, New Zealand. Revised from 3rd New Zealand edition. J. B. Lippincott Co., Philadelphia, Penn. Cloth, 5¾x7¾ in. pp. xii + 335 + 7 index, 17 illus.

A reliable, but elementary, book on the subject of analyses of all kinds including even soils, manures, oil shales, alcohol, sugar and milk. There are 18 pages on the proximate analyses of coal, its calorimetric measurement and the determinations of sulphur and phosphorus. The chemist is supposed to obtain results comparable with his fellows, and it is best therefore for an American to follow recognized American methods. The moisture and volatile matter in coal as determined by analysis are not absolutely definite quantities, but will vary a little with different methods of determination. It is best therefore to follow arbitrary practices in common with other American analysts and not to imitate the methods of foreign assayers until those methods are adopted by other American authorities. If real accuracy is sought, then methods must be adopted such as are described in the report of the Committee on Coal Analysis of the American Society of Testing Materials and the American Chemical Society.

Following an English custom which perhaps dates back to a time when the whole truth of the matter was not apprehended, the author designates as "volatile hydrocarbons" what in America we term "volatile matter." H. C. Porter, of the United States Bureau of Mines, recently stated: "From some bituminous coals, completely dried, we obtain by decomposition as much as 10 per cent. of noncombustible volatile matter and from some lower-grade coals even as much as 15 or 18 per cent. So there can be no question that the term 'volatile combustible matter' as frequently used is decidedly a misnomer." The term "volatile hydrocarbon" makes this same false assumption and regards the product of "distillation" of coal as consisting entirely of compounds of hydrogen and carbon, whereas water is invariably present.

An Elementary Text Book

AN INTRODUCTION TO MINING SCIENCE. By J. B. Coppock, associate of Nottingham University College, and G. A. Lodge, lecturer on mining and mine surveying at Huddersfield Technical College and Batley Technical School. Cloth boards; 4⅞x7 in.; pp. x + 226 + 4 index. 102 illus. Longmans, Green & Co., Fourth Ave. and Thirtieth St., New York City. (Longmans Technical Handicraft series.) 60c., net.

There have been a large number of books published purporting to give just the information needed to secure a mine foreman's certificate—just that and no more. Sometimes questions from actual examinations are given with their answers, so that the reader is assured that he is wasting no time in the studying of matters which are not necessary. Like the foreigner, posted by the astute politician and preparing to attest to the judge that he is fit for citizenship, the would-be mine foreman is prepared for the ordeal of examination by such books as those just described. With such an irreducible minimum, with such cramming without thought, what wonder is it that the students so often fail to pass! They forget what they have been told and do not have the power to reason for themselves.

Cramming May Suit the Pupil, But Not the Industry

Perhaps, however, cramming is all right for the man who wants the certificate, but certainly not for the man who would hire the certificated man. The company which deliberately starts a school to cram scholars for mine foremen is riding to a fall. A company school should give the broadest kind of instruction, and then if a man passes his examination he is sure not to have merely a minimum qualification of knowledge, but an abundance of needful fact and a logical basis of reasoning. After all, the mine foreman's certificate is not the end-all and be-all of mining education as some believe.

This little book—always elementary, always thoughtful and (what is more) always correct—leads carefully from the known fact to the unknown and draws from the pupil a thoughtful consideration of the laws of nature in their relation to mining. However, the experiments described are many, and a certain amount of paraphernalia is necessary to demonstrate the course to the students. But surely every company can afford the small amount of chemicals, the bell jars and flasks which the authors require.

The subjects treated are: Combustible and Incombustible Substances; Air, Its Constituents and Its Actions; Air Currents and How They Are Caused; Increase in Size of Substances by Heat and Its Applications; Principle of the Safety Lamp; Mine Gases Known as Damps; Substances Which, Mixed with Air, Form Explosive Mixtures; Flames, Their Shapes and Parts; Ways of Producing Heat and Light; Inflammability of Substances; Substances Containing Fixed Oxygen; Diffusion or Movement of Gas Particles; Substances and Their Changes; Coal, Its Nature and Origin.

Both Miner and Mine Foreman Need Training

Every opportunity is taken to point the relation of the scientific facts established to the needs of the mining man. The training given here is such that it will be a pleasure rather than a burden when the day's work is done, and it is likely to form the matter of conversation between the pupils.

But the book gives no mathematical discussion of mine gas, ventilation or haulage, and of course the mining law is not touched. It is an introduction and only an introduction to mining science. Nevertheless it is such a pleasant pathway to the study of mining that even those who are not thrilled with the hope of attaining the dignity of mine foreman will desire to know what it has to teach and will find it of use to them in their daily vocations. And after all we waste too much effort on making mine foremen. There are other men who need to know something about the tools they use and the dangers they face and the laws natural and arbitrary by which they are governed. These also will be appealed to by these interesting lessons.

A Cambria County Coal Map

MAP OF CAMBRIA COUNTY, PENNSYLVANIA, SHOWING MINES, COAL AREAS, BASINS, RAILROADS, TOWNSHIPS AND COAL-MINING STATISTICS. By Andrew B. Crichton, civil and mining engineer, Johnstown, Penn. Map 36x39-in. Key sheet 16x32 in. Price, $2.

This map of wall size will be found of much benefit to all who have interests in Cambria County. It gives the locations of all the mines, towns, township roads, streams, township boundaries, anticlines, synclines and reservoirs. The key sheet, or supplement, shows the 212 mines, their names, operating companies, the addresses of the same, their general superintendents, their addresses, the number of employees, the seam worked, its thickness, the kind of opening, the shipping railroad, average daily output in 1912, in 1913 and in 1914, the inspection district and other annotations.

Cambria County coal was first used in 1822, yet in 1840 only 41 men were employed in the county. But in 1914, 25,787 men were working at its mines and producing 16,571,359 tons. In the year before there were 23,277 men and the tonnage was 19,265,395. The year 1914 was a distinctly unfortunate year for the miners of Cambria County, only 206 days being worked as against 268 in the year before.

All the coal in Cambria County is low-volatile in character because by far the greater part of the county lies southeast of the Laurel Ridge, or first anticlinal. Much of the coal lies well under cover, and when this is worked, as it certainly will be because of its excellent quality, Cambria County will put out a much larger tonnage even than today. In the whole county there are only 17 shaft operations and 44 slope mines, the other 151 operations being by drift. Of all the mines, 1 is in the A bed, 85 are in B, 3 in the rider of B, 3 in C, 36 in C', 44 in D, 39 in E and 2 are unknown. It is evident that the B bed takes the lead, and this is largely because of its excellent quality. The D bed is often sulphury in that county, while the C', which in most of the counties of Pennsylvania is a worthless, completely negligible bed, in Cambria is a seam of remarkable value. The leadership of Cambria County as a coal producer is derived from its comparative nearness to the Eastern market and the excellence of the fuel mined.

Coal and Coke News

Washington, D. C.

In his annual report just sent to Congress, the Secretary of the Interior has given a thorough review of the work of the Bureau of Mines for the past year, as well as an outline of the Alaska situation, with reference to coal mining. The report furnishes much hitherto unpublished information regarding the operation and problems of the Bureau.

With reference to the Alaska situation the report says:

Coal Areas—Surveys of the coal areas in Alaska, in the Bering River, Matanuska and Uenana regions, together with classifications of the coal lands and reconnaissances of certain areas for reservation for the use of the Government, as provided by act of Congress, were begun during the past summer. Tests of the Matanuska coal for steaming purposes were made during the year under the direction of the Navy Department, and the coal was found eminently satisfactory. The coal now consumed in the Territory continues to be imported, a considerable portion of which comes from British Columbia. A decrease in the consumption of coal is noted, due to the greatly increased use of fuel oil in the Territory. Three patents of coal lands were issued during the fiscal year. The importation of coal into Alaska from the States and from foreign countries during the last fiscal year amounted to 79,239 tons, valued at $397,290. Of this 32,927 tons, valued at $141,480, was foreign coal, and 46,312 tons domestic, valued at $255,810.

HARRISBURG, PENN.

Despite the fact that both the anthracite coal carrying roads of this state and the coal operators as well asked for a rehearing with reference to the rates for "cereal" sizes of coal, fixed last June, the Interstate Commerce Commission on Dec. 6, decided not to grant such a rehearing.

The present rates will stand. The commission made no comment in denying the petition for a rehearing, but evidently takes the position that nothing has been presented to warrant a rehearing or a revision of the existing rates.

The so-called "cereal" sizes of hard coal, including rice, barley and buckwheat, are being shipped under the schedule of rates fixed by the commission some months ago. There was a hearing on the petition of the coal operators from the state for lower rates last summer and concessions were granted by the commission, the various rates being lowered, but not as much as the operators desired.

The coal operators and the railroads both petitioned for a rehearing, the one side asking an opportunity to show that still lower rates would be justifiable and the other seeking to show that present rates were unprofitable and that higher rates should be restored.

It was decided that there should be no reopening of the anthracite coal cases. Although the railroads claim that they are carrying the coal at rates that are unprofitable, this decision makes it certain that they must continue to carry the sizes of coal that have been under consideration at the rate now in effect.

Is There To Be Discrimination

The State Compensation Board on Dec. 9, adopted a ruling which will require employers seeking exemption from the necessity of insuring their compensation liability to declare whether they will discriminate against a married employee or one with a large family in favor of an unmarried employee or one with a small family. A ruling was also adopted that the board will require a statement whether discrimination will be made against an American in favor of an alien employee and whether any discrimination will be made against a man on account of his age when he is otherwise qualified.

The Attorney General on Dec. 10, gave an opinion holding that the State Treasurer is custodian of the compensation insurance fund and receipts issued by him for payment made for the use of the fund do not have to be countersigned by the Auditor General; that the bonds shall be made to him as State Treasurer and not to the Commonwealth, and that the State Treasurer may designate the depositories for the fund from the list of banks approved for deposit of state money.

Underwriting of Liability Insurance has Begun

Underwriting of compensation insurance covering the liability of employers subject to the workmen's compensation act of 1915, began in all sections on Dec. 13. The statewide activity in liability insurance will follow by the announcement of the State Workmen's Insurance Board of the rates approved by the Insurance Department.

The approved rates which must be observed by the authorized stock and mutual companies are based on each $100 of annual pay roll, and must be applied only for coverage of compensation liability. The state insurance fund is allowed a 10 per cent. deduction under the rates as approved for stock companies.

The manual to be issued containing the approved rates will be the first to be issued in this state, and will contain a number of rulings regulating the writing of compensation insurance.

Rates on coal mining have not been approved by the Insurance Department. Additional data on the hazard in coal mining is being collected and compiled and these rates will probably be available for distribution about Dec. 22.

Principal operation is the governing classification of its risk. Sub-division will not be permitted, unless separate and distinct enterprises are conducted by the same employer without interchange of labor.

Exceptions are made for executive officers, clerical and office employees, salesmen, collectors and messengers, draftsmen, chaffeurs and chaffeur's helpers.

The minimum premium that will be charged by stock companies and mutual companies is $10, except on contractors risks for which it is $20. Blasting operations require an additional minimum of $25.

Francis H. Bohlen, counsel for the Workmen's Compensation Board, on Dec. 13, submitted an opinion declaring that an employee who has accepted the provisions of the workmen's compensation act cannot bring suit at common law against his employer for a work accident resulting in the mutilation of the employee.

A suit now pending in the Court of Appeals in New York State, in which an employee whose ear was mutilated by a horse he was employed to drive, seeks to recover damages from his employer, is regarded by Mr. Bohlen, at not "even persuasive authority in support of the right of an employee similarly injured to maintain a common law accident in this Commonwealth."

Mr. Bohlen points out that under the Pennsylvania act the employee voluntarily accepts the compensation provisions, while in New York he has now power to reject them. Mr. Bohlen further states that the difference in wording of the Pennsylvania act and the New York compensation act would prevent the decision of the New York Appellate Court even if affirmed by the Court of Appeals, from being applicable in determining the right of an employee under the compensation act.

In discussing the status of the employee under the Pennsylvania law, he says: "The employee agrees to give up his common law rights to recover damages for any personal injury due to a work accident and all the harmful consequence which he suffers therefrom and in return receives a right to the compensation provided in the article. He and his family obtain a certainty of a speedy and fixed compensation whenever he is disabled or killed, in place of his previous right to full damages on the comparatively rarely-occurring occasions when he could prove that the accident was due to his employer's negligence. In return he gives up not only his right to full damages for those harms for which compensation is provided, but also all right to any compensation or damages for those infrequent harmful consequences such as mutilation and disfigurements which do not entail loss of earning power and so are not the subject of compensation. It is therefore clear that the sole remedy of any employee who has agreed to accept the compensation provisions of article 3 is under that article and that he can maintain no action at common law for any harm resulting from a work accident whether covered by the compensation schedules or not. There is therefore no right of action at law to recover damages for mutilation or disfigurement not causing disability for more than 14 days. An employee so mutilated is only entitled to the medical, surgical and hospital services which the employer is required by section 306 to supply him and if these are refused and he is forced to provide for himself, his sole remedy is by petition to the Workmen's Compensation Board under section 412 of the Compensation act.

PENNSYLVANIA

Anthracite

Tamaqua—Car shortage due to embargoes and increased freight shipments of other than coal, is causing a serious curtailment in the production this month. Fourteen of the 16 Lehigh Valley Coal Co.'s collieries in the Mahanoy region were compelled to go on short time recently because of car shortage.

Mauch Chunk—During the past week the Lehigh Coal and Navigation Co. has experienced considerable difficulty in securing an ample supply of labor with which to continue the extensive stripping operations which it has under way in various parts of this county.

Duryea—Independent operators who purchased the Bowkley tract of land in this section are making preparations to mine the coal. Drifts have been driven at a point west of Main street and a short distance south of the Lehigh Valley Coal Co.'s Seneca colliery, toward Main street, where the Checker vein is located. The coal will be prepared at the Seneca Colliery which is only a short distance away.

Shenandoah—Many collieries in the Shenandoah Valley were compelled to suspend all operations one day last week for want of railway cars. Thousands of men were made idle.

Jessup—The Dolph Coal Co.'s breaker and boiler houses, one of the best equipped in the Lackawanna Valley, burned on Dec. 11, entailing a loss of $150,000 and throwing 800 men and boys out of work. The breaker was comparatively new, replacing one burned a few years ago. This is the third coal breaker burned in this section within two months.

Dupont—The two public schools of this town, were closed on Dec. 8, on account of surface subsidence. Several homes in the immediate vicinity of the schools were also affected. The cave is believed to be due to disturbances in the workings of No. 2 Heidelberg Colliery. The foundations of the buildings were cracked and the plaster shaken down and the structures thrown out of plumb. One of the buildings is practically a wreck.

Plymouth—The compressor pipe line at Lance No. 11 Colliery of the Lehigh & Wilkes-Barre Coal Co., burst on Dec. 9, and for a time consternation reigned. The pipe line leads down the shaft to the air locomotives and pumps and was carrying a pressure of 850 lb. A length of pipe with an elbow attached was blown across the street, tearing down the fences, poles, telephone and street railway wires. The force of the concussion was so great that the report was heard a mile away and many feared that an interior explosion had occurred.

Laurel Run—The fire which had been raging in the No. 2 colliery of the Red Ash Coal Co. for several days, and which caused thousands of dollars worth of damage, was extinguished on Dec. 9. Water was used to fight the flames. Pipe lines were laid into No. 2 slope and a large force of men were put to work day and night. The cause of the fire is not known.

Bituminous

Connellsville—Two hundred and forty-nine additional ovens were recently put in blast in the Connellsville region, the weekly coke production being now approximately 437,000 tons. The total number of ovens now in operation is about 32,000.

Portage—The local plant of the Miller Shaft Coal Co. was recently compelled to suspend operations as the result of an accident. The breaking of the "bull" wheel allowed the cages to drop to the bottom of the shaft, resulting in their destruction. No one was injured. The cause or reason for the failure of the wheel is not known.

WEST VIRGINIA

Charleston—Fifty-five fatalities in the coal-mining industry were reported to the State Workmen's Compensation Commission for November; 23 of these were caused by the explosion at Boomer the last day of the month. Aside from these the number of deaths for November in all industries was the same as in October, being 40.

A mine-rescue car for the State Department of Mines is proposed. The need of this car has been pointed out by Earle Henry, chief of the Department of Mines, who states that there are 1,100 mines in the state, employing 80,000 men. It is said that had such a car been in use at the time of the Boomer disaster, fewer fatalities would have been the result of the explosion, as it is believed that such a car could have reached the scene in time to have saved many lives.

Gary—The United States Coal and Coke Co. is advertising for more men. This firm is attempting to increase the output of its coke ovens to 2,500 tons per day. It is in need of coke-yard men, coal miners and coal loaders, to the number of about 500.

Phillippi—Improvement in the coal and coke industries of Barbour County continues. The Junior mines, which were closed for a year, are now operating up to the car supply and more workmen are needed. The coke ovens at this plant have also been fired. The Gage Coal and Coke Co. has fired the 60 ovens at the company's plant. Scales for weighing the mine cars have been installed and the men are now paid by weight instead of by the car, as formerly.

KENTUCKY

Whitesburg—Reports from the Letcher County coal field are to the effect that mining operations have been making a continued increase during the last several weeks, while further increases are said to be planned by all the operating companies. The railroads report an increase of nearly 40 per cent. in coal shipments in the last month and improvement of trackage and equipment is in order.

Providence—The Lamb Coal Co. is opening a new mine at Wheatcroft. The shaft adjoins the Illinois Central R.R.

OHIO

Columbus—Miners in western Pennsylvania, Ohio, Indiana and Illinois have asked the operators in the four states to meet in informal conference for the purpose of discussing the question of reviving the four-state wage agreement. So far the operators in Ohio have not expressed a willingness to meet in conference with the miners. Some time ago when Ohio operators were sounded on the question the opinion was almost unanimous that Ohio would not join the other states in the agreement and it is doubtful if operators in other states want the four-state agreement revived.

Stripping operations in Jefferson County, Ohio, are proving successful. The Piney Fork Coal Co., which has offices in Columbus will soon be in a position to load coal at its new operation along the Wabash R.R. The gigantic electric shovel has been installed and the past two weeks has been devoted to removing the earth from the coalbed. It is believed that coal will be loaded by Dec. 15. The Modern Coal Co., which is a subsidiary of the Hocking Fuel Co. has been loading at its stripping operation at Parlette, Ohio for more than a month. The output up to date is in excess of 8,000 tons and the daily capacity is now about 500 tons. Pennsylvania capitalists have started a stripping plant in the same section.

Athens—An order has been issued by the State Industrial Commission's Department of Mines requiring all Ohio mine operators to install a system of checking the employees, as a matter of safety. Checks are to be issued to all persons entering a shaft mine, which must be given up and preserved when they leave, thus forming a record. An order was issued in May suggesting such a system for all shaft mines and all other mines generating gas.

Bellaire—The new mine of the Morgan Coal Co. at Bannock is ready to start operations and will begin working as soon as power can be secured. The company has a contract with the Sunnyside Electric Co. for furnishing power, but the wiring has not been completed. The Morgan mine, at Edge Hill, is still operating, although it will soon be exhausted. The machinery and equipment will then be transferred to the Bannock mine.

ILLINOIS

Duquoin—Depositors of the defunct private bank of Henry Horn, coal operator, have been notified that the trustees of the estate have realized enough from the sale of property to pay a 20 per cent. dividend early in January. This means that about $60,000 will be distributed.

Johnson City—Installation of equipment at the Stiritz mine near here has been completed and operation has begun. The company is composed of local men, headed by City Treasurer A. C. Stiritz. The shaft is located on the old Stiritz homestead.

IOWA

Des Moines—Ten first-aid teams of six men each have been organized by J. J. Forbes, representative of the bureau of mines. This marks the first permanent organization effected in any county of district No. 13, which comprises all of Iowa and northern Missouri. Mr. Forbes has concluded his safety-first campaign at the Iowa Industrial Hospital, but will keep in touch with the teams and return to Des Moines from time to time.

Iowa coal mines are now being operated only 80 per cent. of the time. Most of them are open only five days a week.

according to mine inspectors in conference here. Mild weather has decreased fuel demands. As a general rule the mines are running full blast the early part of December.

WASHINGTON

Zillah—A discovery of coal about 2 mi. from town recently caused the Northern Pacific R.R. to send its experts here to make surveys and tests with a view of securing a new supply for trains.

FOREIGN NEWS

Zurich, Switzerland—Reports reaching here from Austria are to the effect that the supply of coal in Vienna is so small that the question of lighting the city has become acute. The Burgomaster has appealed to the Governor to provide coal for the municipal gas works, so that the capital may not be left in darkness. The city of Laibach and Styria, it is reported, already are without gas on account of the lack of coal.

PERSONALS

E. L. May has severed his connection with the West Virginia Coal Co., to join the selling force of the St. Louis Coal Co.

Paul Bray, recently assistant sales manager for the Joe Taylor Coal Co., St. Louis, Mo., has gone over to the selling force of the Briquette Mfg. Co.

F. L. Swanson, formerly associated with the Kerens-Donnewald Coal Co., has allied himself with the selling force of the West Virginia Coal Co., of St. Louis, Mo.

John J. McDonald, at Hannastown, Penn., was recently appointed mine inspector of the Greensburg District, succeeding D. J. Blower. Mr. McDonald has for many years been the mine inspector of the Jamison Coal and Coke Co.

John Bradwell, of Nesquehoning, Penn., who has been in the employ of the Lehigh Coal and Navigation Co. for 65 years, has been retired by the company on a pension. At the time of his retirement he was assistant mine foreman.

D. J. Stoddard, for several years manager of the People's Mine at Lebanon, Ill., has been promoted to the newly created office of mine superintendent and is succeeded as manager by Thomas Jones. Heretofore Stoddard has acted as both manager and superintendent.

Maj. E. C. Camp, of Knoxville, Tenn., president of the Coal Creek Coal Co., at Coal Creek, Tenn., has been chosen by the Tennessee delegation to the National Rivers and Harbors convention now in session at Washington, D. C., as their candidate for vice-president of that organization.

George W. Fleming has been elected president of the Elkhorn Coal Corporation, which was recently formed by the merger of the Elkhorn Fuel Co., the Elkhorn Mining Co. and the Mineral Mining Co. The firm of which Mr. Fleming is president will operate a large coal tract in the eastern coal fields of Kentucky.

R. H. Buchanan, at present superintendent of the Pine Hill Coal Co.'s colliery at Minersville, Penn., has resigned and it is reported that on Jan. 1 he will enter the employ of the Delaware & Hudson Coal Co., at Scranton. A number of mining men from the Schuylkill County field have taken positions with this company during the past year.

F. Peiter has severed his connection as coke-oven engineer with the Gas Machinery Co., of Cleveland, Ohio. For three years past Mr. Peiter has been engaged in designing and developing the top-burner regenerative coke oven for the Gas Machinery Co. Previous to this association, he was connected with the H. Koppers Co. as designing and constructing engineer. Mr. Peiter has several connections in view, but will take a rest before assuming other responsibility.

General Superintendent William Reinhardt, of the Mineral Coal and Mining Co., at Shamokin, Penn., it is reported will retire from the service of that company on Jan. 1. With his retirement a change in the official personnel of the Mineral company's collieries will be made. Superintendent Auman, of the Lykens-Williamstown district will succeed Mr. Reinhardt, Superintendent Randall, of the Lytle colliery, at Minersville, will go to the Lykens field, A. E. Van Horn, superintendent at William Penn colliery goes to Lytle, while David Williams, at present an official in the Susquehanna field of that company, will succeed Mr. Van Horn.

OBITUARY

William A. Conner, of Plainfield, N. J., died recently at his office in Perth Amboy. Mr. Conner was born in Baltimore in 1859, beginning his business career in Pittsburgh in 1876 in the oil-refining business, in which he later reached the position of assistant manager of the Standard Oil Co. In 1885 he took charge of the first plant built by the Standard Underground Cable Co. in Pittsburgh, and from then until the time of his death he was the head of the manufacturing business of that company, including large plants planned and built by him in Pittsburgh, Penn., Perth Amboy, N. J., Oakland, Calif., and Hamilton, Ont. He has resided in Plainfield since 1904. Mr. Conner, who was a relative of O. G. Waring, of the Standard Oil Co., E. J. Waring, of the Standard Underground Cable Co., and of the late Richard S. Waring, founder of the Standard Underground Cable Co., is survived by a widow, a brother and a sister.

INDUSTRIAL NEWS

Philadelphia, Penn.—The Philadelphia & Reading Ry. in November hauled the largest tonnage of anthracite coal in its history, for that month, 1,163,851 tons, which was an increase of about 30,000 over the previous best November, that of 1911.

St. Louis, Mo.—The Laclede Steel Co., of this city, has purchased the plant of the Alton Steel Co., of Alton, Ill., which was sold recently to Pittsburgh interests under a foreclosure sale. The plant will resume operations Jan. 1, with about 400 men.

St. Louis, Mo.—Increased rates ranging from 3 to 20c a ton on coal in carloads over the Missouri Pacific Ry. from producing points in southern Illinois to stations in Missouri were recently suspended by the Interstate Commerce Commission until Apr. 13.

St. Louis, Mo.—A bill was presented recently before the Board of Aldermen, seeking to supplant the present system of municipal inspection and weighing of coal, eliminating the city weight tickets costing 3c. each required with each load. If enacted into law, it will save to the coal dealers about $30,000 annually.

Terre Haute, Ind.—The Indiana Gas and Coke Co. has let the contract for its plant to the Gas Manufacturing Co., of Cleveland, Ohio. It will represent an expenditure of $750,000 and will have 30 ovens. The subcontract for the coal and coke handling machinery has been awarded to the Heyl & Patterson Co., of Pittsburgh.

Charleston, W. Va.—Harrison B. Smith, Buckner Clay and others, of this city, have organized the Mann's Creek & Meadow River Ry. Co., for the purpose of constructing a line of railroad from Ephraim's Creek to Brackin Creek, in Fayette County, tapping an extensive coal field. The company is capitalized at $100,000.

Whitesburg Ky.—The Consolidation Coal Co., of Jenkins, which is supplying all the near-by operations with light and power, is building transmission lines from Wayland and Garrett, on Beaver Creek, via Lackey, Beaver and Harold, to Pikeville, Pike County, to a connection with the transmission lines there from Jenkins.

St. Louis, Mo.—The Interstate Commerce Commission has set Dec. 27 for the taking of testimony in the case of the Coal Operators Traffic Bureau of St. Louis vs. the Terminal R.R. and other carrier defendants, alleging an overcharge of 5½c. per ton on all soft coal originating in Illinois and delivered in St. Louis between the dates of Feb. 1 and Sept. 30, 1915.

Wheeling, W. Va.—It is stated that actual work has begun on the erection of a power plant at Beech Bottom. It is stated that this generating plant will be second only to the power house at Niagara Falls and will, when completed, be in a position to furnish the entire section with power. It is further stated that an electric railroad will be built to the coal fields of Pennsylvania.

St. Louis, Mo.—A traction line from Bicknell, Ind., in the Knox County coal fields to Evansville, Ind., is being planned, and it is said the line will be surveyed in a short time. A Cincinnati concern is building a $100,000 power plant at Bicknell to supply the city and the coal mines with power, and it is said the plant will also furnish a part of the power for the new traction line.

Ramy, Penn.—T. E. Womelstorff and G. F. Dunkle, operating under the name of the Bermosham Coal Co., recently purchased the Eureka No. 16 Mine from the Berwind-White Coal Mining Co. This firm is operating in the Moshanon seam of coal. The present output is about 100 tons per day, which it is proposed to increase as rapidly as possible. Later on, the B or lower seam will be developed.

Buffalo, N. Y.—A final test of the new McMyler box-car loader was recently made at the coal docks of the Lehigh Valley company here with what appears to have been entire success. Being a new invention the work was slow and it appears to have been perfected only for work on the last Lake cargo of the season. In case it is found to work satisfactorily all work of loading in the Lake trade will be done by it.

Reading, Penn.—The Reading and the Pennsylvania railroad companies have been storing large quantities of bituminous coal for the past two months. The Reading has dumped several thousand tons and a large number of cars have been sidetracked in the vicinity of the water station. This fuel is stored to guard against a sudden change in the weather which would render shipments from the mines uncertain.

Brookville, Penn.—The Pawnee Coal Co., recently incorporated and having large holdings in Knox Township, Jefferson County, Penn., is working out preparations which will, if carried out, eventually make it one of the most important independent concerns in this immediate section. Power plant machinery is being installed and coal cutters will be added shortly. An output of 500 tons per day is anticipated in the near future.

Uniontown, Penn.—To take the place of men which it cannot secure, the Oliver & Snyder Steel Co. is installing two Covington coke-drawing machines at its No. 2 plant. The company has been unable to secure enough men to operate 275 of the ovens. These machines can each pull 40 ovens per day. The plant has been operating six days per week and at the greatest capacity which the limited number of men available would permit.

Harlan, Ky.—The White Star Coal Co. has been organized it Wilhoit, near here, in the Harlan County coal fields, by Major Moss, R. B. Moss, M. J. Moss, Jr., W. L. Moss and R. L. Phillips, all of Pineville, for the purpose of starting work immediately on a coal development near Wilhoit. It is expected, also, that the company will take over the Moss Coal Co., at Wilhoit. The company plans a daily capacity of about 2,000 tons. Mines will be electrically equipped.

Birmingham, Ala.—It is stated that in order to meet the demand for coal resulting from the blowing in of numerous furnaces in the Birmingham district, five new coal mines will be opened in Bibb County in a few weeks. Definite plans have been made by the Coyle Coal Co. for the expenditure of several thousand dollars in the opening of the new mines, the exact amount of which cannot now be determined. The work of erecting the new plants will begin immediately.

Buffalo, N. Y.—With the close of the Lake season the shipping trestle of the Delaware, Lackawanna & Western company will be abandoned and torn down, in accordance with the order of the Secretary of War, to make way for a dump and car loader that will obstruct navigation less. A tariff has been issued for continuing shipments over the Erie Railroad trestle, as the company commonly continues to load storage coal during the winter, for shipment next season.

Cleveland, Ohio—Officials of the Pursglove-Maher Coal Co. and of W. H. Warner & Co., recently announced that they had purchased jointly a coal dock at Superior, Wis., known as Dock No. 4. This dock was purchased from the Reiss Coal Co., of Sheboygan, the site being owned by the Northern Pacific Ry. The Cleveland firms will take possession of the property in May, 1916. This dock has a capacity of 300,000 tons per year and will enable the two concerns to enter a new market.

Charleston, W. Va.—A decree foreclosing a mortgage on the properties in this state of the Paint Creek Collieries Co. and ordering a sale of the holdings for the benefit of bondholders, was recently entered in the United States district court by Judge B. F. Keller. The Scranton Trust Co., of Scranton, Penn., which petitioned for the decree, alleged that the company had defaulted in the payment of interest on $3,000,000 of first-mortgage bonds. No date was set for the sal of the property.

Benton, Ill.—The Illinois Central R.R. Co. is seeking by quo warranto proceedings to get control of a charter granted the Toledo, St. Louis & New Orleans R.R. and the Gulf Line Connecting R.R. of Illinois, to enable the construction of a 100-mi. railroad from Metropolis to Grayville, which would afford an outlet for the big coal fields of that section. The Illinois Central is said to contemplate the expenditure of approximately $3,000,000 on the road. It is hoped to start work early in the spring.

Pittston, Penn.—James White and Theodore Hogan, independent coal operators, have driven a drift into the Checker vein on the old 60-acre Bowkley tract, in Upper Pittston, preparatory to mining operations. The Checker vein and splits from the Red Ash and Marcy underlie the tract. The coal will be sold to the Lehigh Valley and will be prepared at the Senaca breaker, only a short distance away. Much of the mineral in the Checker vein is virgin coal, but the operations in the other measures will be remining.

Cleveland, Ohio—The most important deal put through since the scramble for bulk freighters was started by the Great Lakes shippers and consuming interests more than a month ago was closed when the Cambria Steel Co. and M. A. Hanna & Co., jointly bought four 10,000-ton steamers from the Frontier Steamship Co., of Tonawanda, and one steamer of the same class from the Niagara Transit Co. of the same port. The price paid for the ships was not given out, but it was believed to be something more than $1,500,000.

Ethel, W. Va.—The Rex Coal and Coke Co.'s mine, at Ethel, W. Va., was sold Dec. 6. The new company will operate under the name of New Rex Coal and Coke Co., and will be managed by the following men: L. R. Reese, president, Huntington, W. Va.; J. F. McClung, vice-president and general manager, Ethel, W. Va.; George S. Wallace, secretary and treasurer, Huntington, W. Va. This mining property is known as one of the very best in the Logan field. Negotiations for the sale were conducted by Karl F. Schoew, consulting mining engineer and coal-land broker, of Huntington, W. Va.

Buffalo, N. Y.—The Donner Steel Co. has been incorporated, with a capital stock of $5,000,000, to take over and operate the blast-furnace plant of the New York State Steel Co. The plant, which is to be extensively enlarged, will use large tonnages of coal and coke. The present blast furnace and openhearth furnaces and the blooming mill will be started about Jan. 15, as soon as necessary repairs can be made. Mr. Donner, president of the company, states that a new blast furnace will be built at once and that the company also plans to build a byproduct coking plant to cost $1,500,000.

St. Louis, Mo.—Railroads operating eastward from St. Louis report that the volume of traffic exceeds nearly all periods in which comparisons should be made and that the diversification of freight is now greater than for several years. The westbound movement of freight which has lagged for more than a year is now again about normal. Western roads for the past week report gains ranging as high as 65 per cent. in some commodities over a year ago. The gains in all classifications reflect a sharp betterment. Southern roads report improvement in all classifications of freight. Business is picking up rapidly. Grain, principally corn, is moving freely.

Philadelphia, Penn.—Local exporters of bituminous coal have had their attention called to the extreme shortage of fuel in Italy. The prices have soared rapidly in the past few weeks until $40 has been asked for a ton. It is understood the Italian Government is having considerable difficulty in keeping the various public utilities, such as water-works, lighting plants and gas concerns, in operation. Inasmuch as Italy has no coal mines, it is dependent on other countries and since it became involved in the war the only supplies have been coming from England and in a small measure from the United States. Those consulted in the trade here can hold out but little encouragement of increased shipments from this country, due to the greatly increased consumption at home and also owing to the lack of ships in which to carry the coal.

Uniontown, Penn.—The Tower Hill-Connellsville Coke Co., its receivers, L. W. Fogg, G. S. Harah and John R. Thompson, and the Citizens' Title and Trust Co., of Cleveland, Ohio, are made defendants in a proceeding instituted before Judge E. H. Reppert. J. P. Nutt, Andrew Squire and Philip A. Meyers, holders of general mortgage and improvement bonds of the coke company, have filed a petition praying for the foreclosure of the mortgage given to protect bondholders. The action arises from the failure of the company to meet the last two semi-annual payments of interest on its bonds which were issued Sept. 1, 1910, to the amount of $1,000,000. Under the terms of the mortgage, holders of 25 per cent. of the bands issued can take steps to foreclose in event of default in payment of interest. The petitioners in the present action allege that the trustee has, after due notice, failed to act, and the bondholders named now appeal to the court for enforcement of the provisions of the mortgage. An answer to the petition must be filed within 30 days.

Coal Trade Reviews

General Review

Severe weather precipitates a rush for anthracite. Speculative element in control of the bituminous market and spot tonnages commanding high prices. Coal famine in parts of Europe. Middle Western steam coals make substantial gains and there is considerable stocking.

Anthracite—Storms and lower temperatures, particularly severe at the opening of the week, interrupted deliveries, and caused a heavy influx of rush orders. The situation is decidedly strong, and shows every indication of gaining momentum as the season advances. Pea coal continues the leader, with prices at a high level, and consumers crowding the producers for maximum tonnage. Steam sizes, acting in sympathy with the rapid advance in bituminous, are firmly established at full circular prices, or better, with buyers showing more interest each day. Lake shipments wound up with a rush though the gross tonnage for the season showed a loss, due to the lack of storage room at upper ports.

Bituminous—The soft-coal market has developed into a highly speculative proposition, coal at destination ready for unloading, frequently changing hands several times. The situation is marked with a certain tenseness, as is evident by the fact that large consumers are sending representatives into the mining regions to look up extra tonnage, and by the further fact that there have been tentative negotiations on Pittsburgh coal for delivery at Tidewater points. Prohibitive coastwise freights have diverted considerable business to the Pennsylvania all-rail fields and there is a marked anxiety among consumers at Down East points. Some exceptionally high prices have been done in the spot market on Southern coals, but there is only a meagre tonnage available for such business.

Export—Foreign cables report fabulous prices, and impending coal famines in certain of the nonproducing European states, in spite of which the export movement is constantly receding. The situation is aggravating in the extreme to prospective exporters, and it is difficult to foresee any relief. Each week sees vessel rates marked up to new high levels, and foreign shipping has been confined for some time to contract obligations. Evidence of the restricted market for export fuels is seen in many directions; so much surplus West Virginia coal has been diverted to the Middle West that these grades are noted for their heaviness in an otherwise uniformly strong market, while tonnage statements of the Tidewater coal roads show significant losses, both in the movement and loading at Hampton Roads.

Ohio Valley—The lower temperatures have had a beneficial influence on the local market, though there is no appreciable increase in the business. Further expansion in manufacturing demand, and Eastern inquiry for Pittsburgh coal at Seaboard points, are constructive factors indicating an expanding market, though the demand from these sources has not been in sufficient volume to materially affect the situation. The car shortage remains an important influence in the market; Ohio roads are apparently much better equipped in this respect, and consumers of West Virginia coal are beginning to divert some of their business to operators in the former state. Lake insurance expired at midnight, Dec. 12, and the shipping season is now definitely closed.

Middle West—There is further evidence of increased strength on the steam sizes, prompt tonnages commanding substantial premiums, and indications pointing to higher price levels on these grades than for several years. Manufacturing and railroad interests are taking heavy tonnages, and industrial plants having orders for their products well ahead, and now taking energetic measures to insure their fuel supply. Occasional concessions are noted, but on the whole, the circulars are well supported. Relatively mild weather in the extreme Northwest has restricted domestic buying, though prices remain firm. The expected relief from the car shortage, resulting from the release of equipment used in the Lake trade, has not had time to materialize, though it is noted that the shortage is a trifle less stringent at the moment.

A Year Ago—Cold weather causes a sharp advance in anthracite, though the wholesale market continues heavy. Bituminous operators still pushing vigorously for business. What few changes there are seem to be of a constructive nature.

BUSINESS OPINIONS

Iron Age—Current market reports still deal largely with business offered, which steel companies cannot entertain. Yet in November, when a similar condition prevailed, actual bookings were enormous, as the Steel Corporation's increase of over 1,000,000 tons in unfilled orders is full proof. Some independent companies also booked nearly as much as they shipped last month, but others kept their new contracts down. The outcome of the railroad congestion, particularly in the East, is a matter of no small concern. Iron ore, pig iron and finished materials have been active in the past week in the order named.

Boston News Bureau—It would be difficult to imagine a situation more difficult to diagnose. Now it is the Austrian note, and there are serious potentialities regarding this. But it has been a question of notes for a long time without any important results. There is, however, a more or less indefinite feeling as to the future. There is certainly no greater evidence of peace. There is no longer any doubt as to our business recovery. The improvement is evidently here to stay. When our defence program is started the incentive to much greater activity will be at hand.

Dun—There is no longer complaint of deferred buying, but of difficulty in meeting the steadily expanding requirements. Consumptive demand exceeds supply in some lines and distributing channels are obstructed by the congestion of freight, rail and oversea shipping facilities still being inadequate to cope with the rush of traffic. Evidence of a further recovery in the building industry is provided by the building permits taken out during November, the total from the building departments of 79 leading cities in the United States calling for the expenditure of no less than $56,339,078, an increase of 70.3%, as compared with the $33,073,525 reported for the same month last year. The gains made in November and in the two preceding months have more than made up for the falling off in the earlier months, and the total is not only greater for the year to date than in 1914, but is also well up to that of the active year 1913.

Bradstreet—All reports agree that movements are smarter than they have been at this season for three years past, and in some aspects the situation excels the flush times of December, 1906. Activity covers a multiplicity of lines; whereas this season of the year usually finds wholesale trade quiet, with inventories either under way or in preparation, present currents are such that seasonal dullness is conspicuous by its absence. Business failures for the week ending Dec. 9 were 373, which compares with 333 last week, 427 in the like week of 1914, 371 in 1913, 281 in 1912 and 309 in 1911.

American Wool and Cotton Reporter—The wool market has remained quiet because mills have been taking account of stock, and getting ready for the new season. A fair amount of business has been transacted both in foreign and domestic wools. Values are tending upward in sympathy with the foreign market. Mills are running largely on domestic business, which are in greater volume than war orders.

Marshall Field & Co.—Current wholesale distribution of dry goods for the week was in greater volume than in previous years. Many lines have been advanced, and the market continues firm. Collections are better than last year at this time.

Southern Lumberman—Stability of the yellow pine market, at the price advances which have been noted during the past two months and with present increases in value, now seems assured. This condition is due to the continued and extensive building activity which the unusually fine weather of the fall and early winter has permitted, and to the fact that the railroads are again in the market, on an extensive scale. Despite the near approach of the time for taking inventories and the general slackening up in buying which customarily precedes that business function, in order to put purchases of raw material on the expense sheets of the coming year, the hardwood market is also coming down the home stretch of 1915 with increasing momentum. Consuming factories apparently realize the strength of the market, and exhibit a disposition to buy somewhat in advance of their requirements.

ATLANTIC SEABOARD

BOSTON

Pocahontas and New River temporarily cut off from Eastern spot market. High prices rule at distribution points. Georges Creek out of the market. Pennsylvania grades very active at new high figures. Water freights soaring. Anthracite deliveries slow; active demand.

Bituminous—With Pocahontas and New River at Hampton Roads there is no material change. Accumulations are still heavy and aside from steamers, arrivals are very slow. There is much anxiety in this territory over the light shipments the last month or more and a good many consumers with coal due them are trying to buy all-rail to give them the reserve stocks they require. The situation gets worse from day to day and unless the weather clears for longer periods allowing tows to move, or unless more steamers are available, New England will be getting seriously short of steam coal. It is only a question of time when prices f.o.b. Hampton Roads will stiffen with those at Philadelphia and New York, but as it is the famine in boats is so great that there is small opportunity for merchants to speculate by getting cargoes forward. What boats are chartered at current rates are chiefly to replace others that are behind schedule or lost, and practically all of the coal is for application to season contracts.

As high as $6.25 has been paid for spot Pocahontas and New River on cars, Boston, for delivery up the line, but these grades are available only in small quantities.

The Georges Creek shippers have practically withdrawn their coal from the market and are confining themselves to contract business. Orders are being filled with reasonable promptness but interruptions are feared for the near future. All-rail deliveries do not improve.

The market for the Pennsylvania grades, practically the only coals available for this market for anything like prompt shipment, is very active with prices advancing from day to day. While it is understood that numbers of shippers sent cars forward to the transfer points in anticipation of such a market, yet prices are firm up to $2.75 at the mine and buyers are thick in the regions. Only a fair grade of Somerset County coal sold at more than $5 a week ago, and $4 f.o.b. Philadelphia is not far from the market price there.

Boston dealers advanced contract prices on bituminous from $4.40 to $4.65 per ton of 2,000 lb., delivered by team, beginning Dec. 31.

Water Freights reach a new notch every few days. Bottoms are so scarce that there is no knowing how high rates will go; $3 has been paid to Boston from Hampton Roads, and $2.75 to Providence. One charter is reported of a barge of any size and at any time between now and Mar. 1 at $2.50 to Boston. It is hard to see how freights can recede for a long while to come, unless a lot of tonnage now offshore is attracted to the coastwise trade by rates now prevailing.

Anthracite—Orders continue to pile up and there is a good deal of uneasiness on the part of Tidewater dealers over slow shipments. Some retailers are entirely out of certain sizes, and meanwhile the weather continues cold and unfavorable to movement along the coast.

Bituminous quotations, f.o.b loading ports at points designated, are about as follows:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$3.60@4.00	$3.85@4.25	.....	$2.40@2.75
Cambrias and Somersets	3.75@4.10	4.00@4.35	.....	2.50@3.00
Georges Creek	.....	.....	.....	(Nominal)

Pocahontas and New River prices, on cars Boston, are $6@6.25; Providence, $5.75@6; and f.o.b. loading ports at Hampton Roads, $2.85.

NEW YORK

Anthracite market stimulated by cold and storms. Domestic coals easy but in good demand. Steam grades strong. Bituminous active with Pittsburgh grades being offered here. Many export inquiries.

Anthracite—Colder weather and storms early in the week stimulated the hard coal situation and the market has tightened up. Deliveries were for a time somewhat delayed. Wholesale dealers received many inquiries as to the outlook but were able to reassure their customers. Efforts to increase the movement from the mines met with no more success than last week.

The companies are easy on all domestic coals. Stove is moving slowly, dealers being asked to take mixed cargoes where this size is wanted. There is plenty of egg to meet all demands and chestnut is easy. No pressure is being brought to bear on individual coals which are apparently well sold up. The steam grades are strong. Pea is easy and commanding full circular. All small grades are commanding full prices, the low ash coals being practically sold out. Very little No. 2 buckwheat is to be had at the upper ports.

Reports from along the line are encouraging. Most dealers are fairly well supplied but there is complaint of poor deliveries by the railroads. Demand from New England continues heavy. There is much anxiety over the high water rates and it is predicted that buyers will soon order shipments direct from the mines. This will help to relieve the situation at Tidewater.

Quotations, f.o.b., gross tons, at Tidewater, follow:

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5.05		$5.10	
Egg	5.30	$5.30@5.30	5.35	$5.35@5.35
Stove	5.30	5.30@5.30	5.35	5.35@5.35
Chestnut	5.55	5.55@5.55	5.60	5.55@5.60
Pea	3.50	3.45@3.50	3.55	3.50@3.55
Buckwheat	2.75	2.45@2.75	2.80	2.45@2.80
Rice	2.25	1.95@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—The soft-coal market is active and prices have advanced from 35c. to 50c. over last week, due to the slow delivery. Offers to ship Pittsburgh high volatile coal at $1.25 f.o.b. mines have been received by many local dealers but no orders have been reported as yet.

There has been no improvement in the congestion and many shippers have boats tied up at the docks waiting for deliveries. This has caused an increased shortage of bottoms and also an advance in the harbor freight rates, quotations going as high as 35c.

There is not much quibbling over prices or quality in negotiations on free coals. Contract holders continue to take their full allowance and more when they can. There is sufficient coal at the docks to meet urgent demands but it is nearly all contracted for, very little free coal being offered. Slack is quoted at $1.50 to $1.60.

Current quotations on the various grades, f.o.b. gross tons, at Tidewater follow:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$4.30@4.55	$4.30@4.55	$4.30@4.55	$2.75@3.00
Georges Creek Tyson	3.80@4.00	3.80@4.00	3.80@4.00	2.25@2.50
Clearfield:				
Medium	3.80@4.05	3.80@4.05	.....	2.25@2.50
Ordinary	3.70@4.20	3.70@4.20	.....	2.15@2.40
Broad Top Mountain	.....	.....	.....	2.25@2.50
Cambria County:				
South Forks	3.80@4.05	.....	.....	2.25@2.50
Nanty Glo	3.80@4.05	.....	.....	2.25@2.50
Barnesboro	3.75@4.00	.....	.....	2.25@2.50
Somerset County:				
Quemahoning	.....	3.80@4.00	3.80@4.00	2.25@2.50
Medium	3.75@4.00	3.75@4.00	3.75@4.00	2.25@2.50
Latrobe	3.55@3.70	.....	.....	2.00@2.15
Greensburg	3.65@3.80	.....	.....	2.00@2.15
Westmoreland	3.55@3.75	.....	.....	1.80@2.00
West Virginia Fairmont ¾		3.30@3.40	3.30@3.40	1.50@1.60
Fairmont mine-run		3.30@3.40	3.30@3.40	1.50@1.60
Steam		3.55@3.65	3.55@3.65	2.00@2.10
Western Maryland		3.55@3.70	3.55@3.70	2.00@2.15

PHILADELPHIA

Anthracite brisk with particularly strong demand for buckwheat and rice and heavy orders for pea. Chestnut also beginning to move and broken shows a substantial increase. Bituminous prices touch the $2 mark with the demand still on the increase.

Anthracite—The cold weather and storms have opened up the anthracite trade in full blast and the situation shows indications of continued activity for some time to come. If railroad facilities permit, December tonnage records will no doubt be broken as the trade will gather still greater momentum as the season advances. The dealer trade and manufacturers are now taking energetic measures to cover their requirements and this condition will shortly spread to domestic consumers. But in spite of the strong technical position of the market, there is still a pernicious price-cutting being carried on in certain quarters.

Pea coal continues the leader, individuals now obtaining $2.50 and the tax on this grade, as compared with $1.75 last summer. The $2 and tax price, at which the big companies have protected customers, is probably one of the biggest bargains the trade has known for a number of years.

Broken coal continues brisk at $3.25 on contracts and $3.50 in the spot market, both including the tax. The companies have notified their customers that this grade will be advanced 10c. on Jan. 1, when the current contract expires, so that buyers are urging as rapid deliveries as possible. Egg coal is the only weak size, individuals having been compelled to make concessions of 15 to 25c. off the $3.75 circular price on cars standing at the mines without orders. Stove continues

strong at the full circular of $4.90 and the tax, and there is apparently little surplus of this grade available.

The outstanding development of the week has undoubtedly been the impressive advance of the steam coals which are now commanding the full circular, even on the storage grades. The steam sizes have apparently been carried up with the rapid advance in bituminous coal, with which they are in competition, and with hundreds of thousands of tons in storage, the increased demand is more than welcome. The call for buckwheat has been so heavy that many orders are still unfilled, and rice coal, which has been dragging behind for so long, is now moving with no trouble.

The announcement of an increase in prices on the new contracts, effective Jan. 1, was another important development of the week, and has caused a marked hesitancy on the part of buyers, so that negotiations on this business are behind a normal season.

The circular prices per gross ton at the mines for line shipment and f.o.b. Port Richmond are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.50	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—The demand for coal is increasing at such a rate that some big consumers are sending their purchasing representatives to the mining regions. Brokers and speculative interests are active and it is nothing for a car of coal, after reaching destination, to pass through three or four hands before it reaches the ultimate consumer. In addition to the rapidly increasing local demand there is a growing demand for coal from the New England territory via rail because water freights have advanced to such a point that it is more advantageous to get shipments by rail. Prices have gone steadily upward and the $2 price has been recorded for four or five of the different grades. There is hardly any foreign trade outside of that contracted for some time ago. While prices for the local trade are only quoted for prompt acceptance, often changing over night, the following table will give an idea of the average, prevailing up to date, per gross ton at mines:

Georges Creek Big Vein	$2.20@2.30	Fairmont gas, ¾	$1.60@1.70
South Fork Miller Vein	2.25@2.30	Fairmont gas, mine-run	1.40@1.50
Clearfield (ordinary)	2.00@2.15	Fairmont gas, slack	1.20@1.30
Somerset (ordinary)	2.00@2.10	Fairmont lump, ordinary	1.45@1.55
West Va. Freeport	1.90@2.00	Fairmont mine-run	1.35@1.45
		Fairmont slack	1.20@1.30

BALTIMORE

Car supply occasionally down to 25% requirements. Vessel freight rates at prohibitive levels. Practically no coal at Tide. Heavy snow complicates retail situation.

With the Baltimore & Ohio, Western Maryland and Pennsylvania supplying at times, less than 25% car requirements at the mines, coal has been growing steadily scarcer at the terminals. The supply at Tide here occasionally falls off to practically nothing. Many coals are selling at big advances over what they would bring at the mines if cars could be supplied. Some of the railroads such as the Erie and Lehigh Valley have sent their own equipment to mines on the Baltimore & Ohio to obtain coal for their own use. Where coal is bought on a basis insuring early delivery prices are substantially higher.

Quotations, while changing from day to day, are about as follows:

	Mines	Balt.*	Fairmont	Mines	Balt.*
Geo. Crk. Big Vein	$2.50	$3.68	Ordinary mine run	$1.65	$3.13
Geo. Crk. Tyson	2.10	3.28	Ordinary ¾	1.80	3.28
Clearfield	1.90	3.08	Ordinary slack	1.25	2.68
South Fork	1.95	3.13	Low sulphur mine-run	1.90	3.38
Latrobe	1.85	3.03	Low sulphur ¾	2.00	3.48
Somerset (best)	1.90	3.08	Low sulphur slack	1.30	2.73
Somerset (good)	1.80	2.98			
Quemahoning	2.00	3.18			
Freeport	1.80	2.98			
Miller Vein	1.90	3.08			

* F. o. b., outside Capes.

The retail situation has been complicated by the heavy fall of snow on Monday and Tuesday. This caused an increased pressure for deliveries of anthracite and dealers were forced to draw more heavily on reserve stocks than they desired.

HAMPTON ROADS

Dumpings for week fair. Vessel tonnage scarce and rates high. Concessions on prompt tonnages.

Dumpings over Hampton Roads piers for the week have been fair. Bunkering has been rather light. The accumulation at Tidewater is above normal and demand light, especially on the New River and Pocahontas coals. On high volatiles there seems to be some improvement and some small quantities of gas coal have moved foreign during the week. There is some scarcity of high volatile grades at Tidewater due to the usual demand at about this time in the West. While the regular circular is being quoted it is believed that prompt coal can be bought at 10 to 15c. off. Prices on high volatile range from $2.55 to $2.65.

During the last few weeks householders here have been offered a new fuel in the form of briquettes for domestic use. The promoters claim that they are smokeless and odorless, give 50% more heat and are much cheaper than coal. It is understood that they will sell at about $6 per ton against $7.50 for Pennsylvania anthracite.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Nov. 13	Nov. 20	Nov. 27	Dec. 4	Dec. 11
Norfolk & Western	133,329	100,598	118,065	116,450	87,726
Chesapeake & Ohio	70,282	67,209	93,924	81,875	70,535
Virginian	72,888	39,485	54,591	41,386	52,247
Totals	276,499	207,292	266,580	239,711	210,508

Ocean Charters, Clearances and Freights

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
G. E. Walcott	Buenos Aires	1,388	
C. Davenport	Porto Rico	1,157	
Wm. C. May	Cartagena	607	5.30
D. G. Cressy	Porto Rico	726	
Isthmian	Rio Janeiro	3,463	

VIRGINIA

Platea	River Plate	1,956	12.60
M. W. Bowen	Buenos Aires	1,907	
R. W. Clark	Bermuda	437	3.75

BALTIMORE

Vessel	To	Tons	Rate
Mar Caspio	Barcelona	1,632	
Mar Cor	Italy	2,059	
Gov. Powers	Porto Rico	1,578	
A. W. Barbour	Porto Rico	1,171	
V. A. Boughton	Cuba	1,909	
Bygland	Bocas del Toro	1,464	

VESSEL CLEARANCES

The following steamers have cleared from various ports during the week ended Dec. 10:

NORFOLK

Vessel	Destination	Tons
L. Bossert[1]	Bermuda	842
Adriatico[2]	Naples	5,705
Berwindmoor[3]	Havana	8,000
Eliofoli[2]	Genoa	5,094
H. A. Stone[3]	Cienfuegos	1,993
Antares[3]	Vera Cruz	2,500
A. Barbour[3]	San Juan	1,782

NEWPORT NEWS

Frankrig[4]	Havana	2,090
Hubert[5]	Para	382
R. B. White[6]	Gardenas	600

NEWPORT NEWS—Continued

Vessel	Destination	Tons
Siam	Buenos Aires	2,293
Kaministigua[5]		2,800

PHILADELPHIA

Storfond	Havana	
Rio Colorado	Rio Janeiro	
St. Joseph	Savona	
Negus	Sagua le Grande	
E. H. Blake	Bermuda	
St. Gothard	Havana	
F. J. Lisman	Antilla	
Eurasia	Savona	

[1] Castner, Curran and Bullitt, Inc. [2] Pocahontas Fuel Co. [3] Baker Whiteley. [4] Smokeless Fuel Co. [5] Berwind White. [6] Ches. and Ohio Coal and Coke Co., Ches. and Ohio Coal Agency.

OCEAN FREIGHTS

Since last report the Greek Steamer "Platea," about 5,000 tons coal capacity, December loading, was chartered from Virginia to a Lower Plate port at $12.60, with 500 tons per day discharge at 30c., and we have another boat offered on these terms. There is an active demand for steamers for Cuban and West Indian ports and we have recently closed a number of boats on terms quoted below. The only coal that we are moving for Mediterranean ports is on steamers that we are chartering on time charter. About $22.80 is now offered on grain to the west coast of Italy, and vessel owners seem to prefer grain to coal on the same basis of freight.

We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$3.00@3.25	Bermuda	$4.00@ 4.25
Cardenas or Sagua	3.50@4.00	Vera Cruz	5.50@ 6.00
Cienfuegos	3.75@4.00	Tampico	5.50@ 6.00
Port au Spain, Trinidad	4.75@5.00	Rio*	12.00@12.60
St. Lucia	4.75@5.00	Santos*	12.00@13.20
St. Thomas	4.25@4.50	Montevideo	12.60@10.80
Barbados	4.75@5.00	Buenos Aires or La Plata†	12.60@13.20
Kingston	4.25	Rosario	13.20@14.40
Curacao	4.50	West Coast of Italy	22.60@24.00
Santiago	4.00@4.25	Barcelona**	20.40@21.60
Guantanamo	4.00@4.25	Valparaiso or Callao	12.00@13.00
Demerara	6.50@7.00	Marseilles	20.40@21.60

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

Note—Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge. 24c. per net register ton per day demurrage."

OHIO VALLEY

PITTSBURGH

Inquiry for Pittsburgh coal at Seaboard. Car scarcity continues. Line demand good. Slack higher.

As a result of the heavy demand for coal in the East, it was positively asserted on excellent authority that $1.75 had been bid for Pittsburgh coal where the seller could assure immediate shipment by furnishing car number at the time the business was negotiated. With the car supply continuing very short it has not been possible to accept much of this business, but it is understood that some shippers have been able to take up some of these offers in the case of a few cars. The full quota of empty cars has not returned to the coal mines upon the closing of Lake navigation, just as was expected in some quarters.

Domestic trade has improved considerably and there is a moderately good movement to retail dealers. There continues to be an excellent demand from manufacturing establishments, and perhaps a slight increase. The market is not suffering particularly from the cessation of Lake shipments, as to mine-run and screened coal, while as to slack there is naturally a further stiffening. Prompt slack is now bringing very close to the mine-run basis and in some quarters predictions are made that eventually the two descriptions will sell at practically the same level.

We quote free coal as follows: Slack, $1@1.05; nut, $1.15; mine-run, $1.15@1.20; ¾-in., $1.25@1.35; 1¼-in., $1.35@1.45; on contract to Apr. 1. Slack, $1@1.10; nut, $1.25; mine-run, $1.25@1.35; ¾-in., $1.35@1.40; 1¼-in., $1.45@1.55, per net ton at mine. Pittsburgh district.

BUFFALO

Marked activity in bituminous and the supply is short. Scarcity of men and cars. Fictitious prices being quoted.

Bituminous—The demand exceeds the supply everywhere and there is no surplus coal. Allegheny Valley grades are difficult to get and prices are past any sort of intelligent quoting. Shippers generally advise making a nominal quotation only, as it is often purely a matter of getting the coal. Slack is sometimes bringing prices that would have seemed extravagant a month ago. One shipper estimates that the Buffalo market proper has advanced 25c. An out-of-town jobber is reported to have bought a block of coal here that he sold in New England at 35c. advance. As a rule the Allegheny Valley mines are out of slack and will not quote on it. Pittsburgh slack is not so scarce and it may not give out.

Quotations are made with a certain reservation, especially as regards Allegheny Valley coal, as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.80	$2.60	$2.55
Three-quarter	2.65	2.40	....
Mine run	2.55	2.30	2.30
Slack	2.15	2.15	2.30

Quotations are f.o.b. cars at Buffalo or the Niagara bridges and per short ton except east of Rochester or Kingston, Ont.

Consumers of bituminous are now sending in nervous telegrams, urging dispatch on the part of shippers, much as anthracite buyers commonly do in December.

Anthracite—There is some improvement in the demand, and with the coming of snow the trade ought to show more life. Should Canadian activity increase the shippers would be satisfied, though there is not much prospect of regaining the lost tonnage. As the season progresses the prospect of making up the loss becomes more remote though sales are fairly good. Chestnut is very scarce, but egg is abundant. The independent shippers are getting full circular prices and are predicting a premium in certain sections soon. Locally, the trade is only fair, though domestic consumers have not stocked up much yet.

The Lake season is practically closed The December shipments are about as heavy as in any previous season, being 104,126 net tons. That the entire amount has been less than for the season of 1914 is only because unloading space has not been available, owing to the large amount left over last spring.

COLUMBUS

Steam business continues to improve. Domestic trade a trifle slow. Prices are generally well maintained.

The best feature of the trade is the increased demand for steam sizes in sympathy with the general expansion in manufacturing. Steel plants are buying well and railroads are taking a larger tonnage both for immediate use and for storage purposes. Shortage of cars is having its effect on the trade and many factories which formerly depended on West Virginia mines are looking to Ohio for steam grades. The car shortage is the most pronounced on West Virginia roads.

Domestic business is a trifle slow following a rush of orders due to the lower temperatures. Dealers have placed orders for immediate shipment and are going slow in taking on extra business. Retail prices have advanced; Pocahontas lump is now selling at $4.75 and Hocking lump at $3.50. Anthracite business is slowly increasing in central Ohio territory.

The Lake trade is now over and arrangements are being made for the coming year. Operators generally predict a better Lake trade in 1916 than in 1915. It is believed that the tonnage on the docks of the upper Lake ports will be used up completely during the winter leaving a deficiency, compared with the spring of 1915.

Prices in Ohio fields f.o.b. mines, per short tons are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65	.....	.....
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter-inch	1.35	1.40	.....	1.35
Nut	1.25	1.30	.....	1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.90	.95	.80	.80
Coarse slack	.80	.85	.70	.70

CLEVELAND

Eastern demand seems to be affecting this region. Prices are unaccountably higher. The retail trade slowing up.

The trade here is having no difficulty getting all it needs, but fine coal prices are higher, due to the larger demand from the East and from the steel industry. The shutting off of Lake shipping has also curtailed the production of fine coal and this is felt distinctly. Operators have refused orders for coal for this district because of the higher market in other directions.

The retail trade is over the first rush, having taken in the initial fall orders, and is now waiting for the steady business that marks the winter, with now and then a spurt, due to cold weather. Ohio fine coals are coming into this market now; coarse grades are confined to Ohio coals and domestic sizes of smokeless. Youghiogheny does not come into this market very much, but jobbers are buying for out-of-town trade at quotations. The Pocahontas coarse coal market is weak, due to the fact that New England shipments are curtailed by a shortage of coastwise tonnage and operators are forced to sell where they can.

Jobbers are paying the following prices f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Bergholz	Wainwright	No. 8
Freight	$1.45	$1.00	$0.70	$0.70	$0.90
Lump	3.25	.....	.....	.....	....
Lump, 6 in	.....	.....	2.30	.....	....
Lump, 1¼ in	.....	2.30	2.10	2.30	2.05
Lump, ¾ in	.....	2.20	2.00	2.10	1.95
Lump, 3 in	.....	.....	.....	2.40	....
Egg	3.25	.....	.....	.....	....
Mine run	2.70	2.15	1.90	1.95	1.90
Slack	.....	2.00	1.90	1.90	1.90

TOLEDO

Domestic grades quiet but steam business active. Navigation closed.

The domestic market has been a little off owing largely to unfavorable weather conditions. There seems to be something of a surplus of this grade. Steam coal is generally strong so far as egg and slack is concerned. Lump is more of a drug on the market and Pocahontas lump is down to $2. Some of the dealers claim to be getting this price but there are some offerings as low as $1.80. Large steam consumers do not seem to be over supplied although all are carrying average stocks. The navigation season has officially closed but there are still a few boats moving, cleaning up the stocks on the local docks.

The Hocking Valley Railroad Co., it is announced is planning to spend $250,000 in extensions of its Toledo dock yard on the East Side. Millions are to be spent in double tracking this road between Toledo and Columbus. With the completion of a connecting link between the C. & O., and the Hocking in 1916, it is estimated that additional room will be needed as will also additional yard facilities at Walbridge.

DETROIT

Steam coal buying continues steady. Demand for domestic coal shows slight improvement. Anthracite quiet. Shippers pay higher rate for boats.

Bituminous—Regularity of orders, even though sales are not particularly large, is a steadying influence in the market. Small sizes are the most active and shortest in supply. Egg

coal is the slowest size though there has been no reduction in price or large accumulation of stocks. The domestic market has improved due to the continued low temperatures. Car shortage appears more acute on certain Pennsylvania lines in Pennsylvania, than on any of the Ohio roads. Sales of consignment coal are now being made on practically the same basis as mines prices.

Anthracite—The trade is fairly active on chestnut. Some shippers have difficulty disposing of the larger sizes they are obliged to take in order to obtain enough chestnut for their needs.

Lake Trade—With only a few days of the navigation season remaining shippers are showing considerable anxiety to get boats. Rates of 75c. a ton are being paid on small cargoes. Some vessel owners are offering boats at a $1 rate but contracts have not been made and the expiration of the insurance limit at midnight, Dec. 12 leaves very few freighters available.

CINCINNATI

Improved sentiment, with better demand and firm prices. More cars and colder weather.

There is a more optimistic feeling in the trade though without any tangible improvement. More wintry weather has appeared resulting in greater strength on the domestic grades while the steam market has also been strong. Both nut and slack and mine-run have participated in the improvement. Slightly better car supply at the mines is also reported, the average supply now being about four days, as compared with three days and less a short time ago. The market will be stronger as the winter advances.

LOUISVILLE

Winter demand has greatly stimulated the domestic market. Operations at the mines are generally on a larger scale and the supply of labor will apparently prove equal to requirements. Steam coals are in continued good demand and reflect the improved industrial conditions. Prices show little if any change.

COKE

CONNELLSVILLE

Anxiety concerning supplies over the holidays causes a heavy buying movement and sharp advance in the prompt market. Production and shipments slightly increased.

Conditions in the pig-iron market make it certain that all furnaces capable of operating will be blown in, as pig iron prices have been advancing sharply, but the advances may be due chiefly to there being no means of increasing output, and hence there can be no material increase in coke consumption. With so many byproduct plants to be completed in the next six months the coke outlook is particularly blue since beehive coke will be correspondingly released.

Anxiety over the increasing car shortage and the possibility of interruptions over the holiday period created a spectacular advance in the coke market the early part of the week. Sales of prompt furnace coke have been made at $2.50, while rumors of a $3 figure were heard and prompt foundry coke sold as high as $3.75. We quote prompt furnace $2.50@3 and prompt foundry at $3.25@3.75; contract furnace, six months, $2.35@2.50; year, $2.25@2.35; contract foundry, $3@3.25, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Dec. 4 at 437,251 tons, an increase of 4,910 tons, and shipments at 439,165 tons, an increase of 4,081 tons.

Buffalo—The market is a trifle dull. There was a slight falling off in the price last week, caused by reaction from over-booming the trade. The market has recovered, probably on account of car shortage. The consumption appears to increase. Prices for this market, f.o.b., range from $5 to $5.20 for best 72-hr. Connellsville foundry and $4.30 for stock coke.

Chicago—The coke market is brisk with the demand for furnace and foundry sizes unabated. Byproduct domestic sizes are also in better demand. Prices per net ton, f.o.b. cars Chicago, are as follows: Byproduct, foundry, $5.25@5.75; byproduct, domestic, $4.75@4.95; Connellsville, $5.25@5.75; Wise County, $5.25@5.50; gas coke, $4@4.25.

St. Louis—Between domestic and industrial consumption, byproduct coke is enabled to maintain a fairly steady movement. Mild weather has checked sales for gas house. Very little demand for petroleum coke. The following prices prevail f.o.b. cars St. Louis: By-product (all sizes), $5; gas house (lump or egg), $4.25; petroleum, $6.25.

MIDDLE WESTERN

GENERAL REVIEW

Weather more seasonable. Steam coal buying continues in steady volume. Domestic demand below expectations. Screenings strong.

Developments of the past week have shown pronounced evidence of strength in steam coals and screenings, while domestic buying has slacked off owing to lack of snappy cold weather. Retailers complain that buying by the public is still in small lots, with little disposition to put in reserve stocks. Some concessions in spots have been made on coarse domestic sizes, but on the whole list prices are well supported. The domestic trade is fair but not up to expectations, though the steam sizes are bullish at higher prices.

Fine coal is likely to continue at maximum prices unless severe wintry weather prevails for an appreciable period. Many operators and wholesalers refuse to quote on fine coal, and open shipments are sold quickly at high prices; it is felt that many industrial plants will have to pay higher prices than for a number of years. Operators are holding coarse coals at the mines rather than rush shipments into the markets to be sacrificed at low prices. The smokeless market is still feeling the effects of the recent sacrifice of several hundred cars of smokeless lump and egg at mine-run prices; this is about the only real weak feature of the situation. The expected improvement in the car supply due to the release of the equipment used for lake cargoes, has hardly had enough time to materialize, though it is noticeable that supply is easier.

INDIANAPOLIS

Indiana mines on full schedule, due to demand from railroads and industrial plants. Screenings prices higher. Weather still unfavorable to domestic trade. Car situation satisfactory.

Indiana has had no real winter weather as yet but most of the mines are making full time, due chiefly to the buying of railroads and industrial plants, many of which are stocking earlier than usual in preparation for the biennial wage conference. Screenings have strengthened and are commanding 85c. in the open market for Nos. 5 and 6. The larger companies say they have very little to offer in their home territory. No. 4 1¼-in. steam coal sells at $1.40 f.o.b. mine and domestic lump at $1.50 for Nos. 5 and 6 and $1.65 for No. 4. Many of the industrial plants, particularly steel concerns have sold far ahead and are taking no chances on their coal supply, which accounts for the large orders. The weather is against an active retail trade, but dealers are not complaining.

CHICAGO

Smokeless coals still demoralized. Screenings advancing. Coarse steam shipments heavy. Anthracite quiet.

Orders for Franklin County domestic sizes have been arriving in better volume lately. Williamson County coal is moving slowly, but at good prices, mostly to Northern points, shipments to the South having fallen off slightly. Screenings are in stronger demand, and No. 2 nut is taken freely. Fine coal is strong at about 80c. with future shipments quoted at 85c. Saline domestic lump, egg and No. 1 nut are easy.

Springfield domestic lump has been easy, but no sales are reported at less than $1.65. The demand for Springfield screenings from the Chicago district has been unusually heavy the past week. Egg coal seems to be in better demand than lump.

Railroads are stocking increased quantities of Indiana 1¼-in. steam lump. Less than the usual volume of Indiana coal is moving to Chicago. The demand for steam coals seems to come chiefly from Indiana factory towns. Mines are operating every day, screenings are scarce and domestic-lump business is good.

Smokeless is still in a poor position because of the recent dumping of a heavy tonnage of consignment coal in the Chicago market. Prepared sizes have sold as low as $1.65, and some mine-run has been sacrificed below $1.25; $2 on lump and egg, and $1.75 on nut in flat bottoms, with prices 15c. lower on hopper shipments are claimed to be the established prices at this time. Stocks of West Virginia smokeless coal are at the maximum, and the outlook is not promising. The situation is due to the closing of navigation, which caused an abnormal amount of Lake smokeless to be thrown into the Chicago market by rail at an unpropitious time, though it is thought that all this surplus coal has now been absorbed. Pennsylvania smokeless was but little affected by this state of affairs. Splint shows no life because prices continue too high to make shipments into this territory attractive.

A slight improvement is shown in the demand for anthracite, and orders for chestnut the last few days have reached Chicago in increasing volume. In many Illinois cities coke is now becoming the formidable competitor of anthracite. The increasing use of coke is causing many retail dealers to question the continued use of heavy coal-lifting machinery because of the light weight of coke as compared with anthracite.

Quotations in the Chicago market are as follows, per net ton f.o.b. mines:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.60@1.75	$1.60@1.75	$1.50@1.65	$1.40@1.60	$1.40@1.60
Steam lump	....	1.25@1.35	1.20@1.35	1.15@1.25	1.10@1.25
2½ and 3-in. lump	....	....	1.40@1.50	....	1.30@1.45
1¼-in. lump	....	....	1.25@1.35	1.20@1.30	....
Egg	1.60@1.75	1.50@1.60	1.15@1.25	1.10@1.25	1.15@1.25
Nut	....	1.60@1.65	.95@1.05	1.00@1.10	1.00@1.10
No. 1 washed	1.65@1.75	....	1.50	....	....
No. 2 washed	1.40@1.50	....	1.40	....	....
No. 1 nut	1.65@1.75	....	....	....	....
No. 2 nut	1.50	....	....	....	....
Mine-run	1.10@1.15	1.05@1.10	.85@1.00	.95@1.05	.85@1.05
Screenings	.75@.85	.70@.75	.70@.85	65@.75	.75@.85

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.65@1.75	$1.60@2.40	$1.40@2.25	$1.75@2.00	$1.75@1.85
1¼-in. lump	1.30@1.40	....	....	....	1.50@1.60
Egg	1.60@1.75	1.35@2.00	1.40@2.25	1.70@2.00	1.00@1.10
Nut	....	1.25@1.60	1.40@1.75	1.40@1.60	....
No. 1 nut	1.60@1.75	....	....	....	....
No. 2 nut	1.40@1.50	....	....	....	....
Mine-run	1.15	....	1.10@1.40	1.25@1.40	1.15@1.25
Screenings	.70@.80	.70@.80	....	....	.75@.90

ST. LOUIS

Screenings advance still further. Standard grades slightly stronger.

Screenings advanced another notch during the past week. Franklin and Williamson County screenings which were around 65 to 70c. are now strong at 75c. Standard and Staunton, which ranged last week from 55 to 60c. are now from 60 to 65c. The Standard list is a trifle stronger in almost all grades, but there is little movement of lump. The industrial situation is about the same.

Quotations f.o.b. mines are on the following basis per short ton:

	Frnk. Co.	Wlmson. Co.	Staunton	Standard
6-in. lump	$1.50@1.65	$1.50@1.65	$1.25	$1.15@1.25
8-in. lump	.....	.....	.....	1.15@1.25
2-in. lump	.....	.....	1.15	1.00
3x6 egg	1.40@1.65	1.40@1.65	.....	.95
2x6 egg	.....	.....	.....	.85
No. 1 nut	1.50@1.75	1.50@1.75	.....	.85
No. 2 nut	1.25@1.50	1.25@1.50	.....	.85
No. 1 washed	.....	1.40@1.50	1.40@1.50	.....
No. 2 washed	.....	1.25@1.40	1.25@1.40	.....
No. 3 washed	.....	1.15@1.25	1.15@1.25	.....
No. 4 washed	.....	1.15@1.25	1.15@1.25	.....
No. 5 washed	.....	.75	.75	.....
Screenings	.75	.75	.60@.65	.60@.65

Freight Rates—Inner group, St. Louis, 57½c., East St. Louis, 37½c. Outer group, St. Louis, 72½c.; East St. Louis, 57½c.

DULUTH

Mild weather affects the trade. Only a fair amount of coal moving. Prices firm. Lake shipping practically over.

The absence of any really cold weather caused a rather sluggish movement on all the prepared sizes of bituminous coal. Hand-to-mouth buying prevails to a large extent. Very little coal was received during the week, many of the boats having been laid up for the winter and navigation is now practically over. Prices remain very firm, no deviation from circular being reported. Quotations per short ton, f.o.b. cars at Duluth docks are as follows:

	Yough	Splint	Hock	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock run	3.10	3.10	3.10	3.25	3.25
Egg, stove and nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.[illegible]	2.55

There has been very little life to the anthracite trade due to the extremely mild weather, and the trade is anxiously awaiting a drop in the temperature that will undoubtedly create an influx of orders. Prices are as follows per short ton f.o.b. docks: Nut, $7.10, stove and egg, $6.85, pea $5.55 and buckwheat, $4.

KANSAS CITY

Steam demand is somewhat heavier and colder weather has quickened the domestic trade. Selling has been heavier than for some time past and mines in the Missouri, Kansas, Oklahoma, and Arkansas fields are working steadily. No increases have been asked, although some mine owners have been forced to go into the open market to obtain supplies. A tendency is noted among concerns using fuel oil to change back to coal as a result of the present high prices that have greatly forced up fuel oil.

PRODUCTION AND TRANSPORTATION STATISTICS

ANTHRACITE SHIPMENTS

The shipments of anthracite for November 1915 as reported amounted to 6,297,215 long tons, which establishes a new record for November shipments for the region. The largest previous November shipments were in 1911, when 6,193,314 tons were sent to market. The largest shipments in any one month were in October 1912, when they totaled 6,665,321 tons. These figures were closely approached by the shipments of October 1914, which amounted to 6,664,476 tons. Compared with November 1914 the shipments last month showed an increase of 368,929 tons, and compared with October of this year they exhibit a decrease of 208,677 tons.

TIDEWATER STOCKS

	Tons		Tons
Port Reading	44,040	Port Johnson	21,954
Port Richmond	153,970	South Amboy	306,058
Greenwich	8,006	Perth Amboy	53,868
Canton Piers	3,315		
Elizabethport	19,450	Total	610,661

Shipments for November and the first ten months of 1914-15 were as follows:

	November		10 Months	
	1915	1914	1915	1914
Phila. & Reading	1,163,851	1,082,344	10,358,940	11,043,952
Lehigh Valley	1,190,103	1,139,467	11,904,105	12,081,410
Cent. R.R. of N.J.	762,140	761,897	7,294,834	8,214,332
Del. Lack. & West.	971,389	881,645	8,651,189	9,010,438
Del. & Hudson	694,386	638,892	7,365,989	6,671,589
Pennsylvania	616,190	595,819	5,487,151	5,904,737
Erie	696,890	622,154	7,221,557	7,565,548
Ont. & Western	202,266	206,068	1,898,453	2,148,337
	6,297,215	5,928,286	60,182,218	62,640,343

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during November and the past four months in short tons:

	August	September	October	November
Pocahontas Field	1,721,578	1,620,862	1,720,613	1,482,015
Tug River District	337,585	354,981	375,743	339,154
Thacker District	227,312	230,198	264,619	268,299
Kenova District	80,152	89,921	95,438	92,587
Clinch Valley District	151,804	144,234	142,187	118,553
Other N. & W. Territory	4,239	3,798	4,636	5,277
Total N. & W. Fields	2,522,665	2,443,494	2,603,236	2,305,885
Williamson & Pond Creek	89,785	87,152	95,188	90,052
Tug River & Ky. R.R.	.....	.....	60,050	57,039
All other railroads	348,124	324,913	268,762	245,730
Grand total	2,960,574	2,855,559	3,027,236	2,698,706

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for September, 1914-15, and for the nine months ending September, 1913-14-15, in long tons:

	September		Nine Months		
Imports:	1914	1915	1913	1914	1915
Anthracite, total	2,355	134	836	18,257	2,524
Bituminous, total	128,771	126,282	1,035,887	990,284	1,077,799
United Kingdom	102	500	4,597	8,410	16,110
Canada	101,646	111,000	828,013	771,158	869,634
Japan	90	5,200	79,075	44,539	62,119
Australia	26,933	9,578	121,386	164,124	127,356
Other countries	.....	4	2,816	2,053	2,580
Coke	16,977	2,982	58,838	83,980	36,602
Exports					
Anthracite total	395,088	289,790	3,173,002	3,062,057	2,594,754
Canada	389,213	276,583	3,119,522	3,017,158	2,538,305
Argentina	.....	134	.....	.....	2,469
Brazil	6	.....	.....	6	2,415
Uruguay	.....	.....	.....	.....	605
Other countries	5,869	13,073	53,480	44,893	50,960
Bituminous total	1,857,520	1,832,977	13,793,963	10,902,780	12,421,560
Italy	.....	324,925	.....	.....	2,348,870
Canada	1,202,930	944,800	10,283,998	7,241,856	5,682,455
Panama	23,166	59,969	387,582	214,131	389,419
Mexico	42,312	21,787	397,753	257,380	238,033
Cuba	97,787	109,269	983,392	793,898	843,805
West Indies	64,099	44,835	464,645	479,923	353,440
Argentina	55,567	56,305	55,877	193,786	719,019
Brazil	45,846	61,223	211,045	201,071	544,194
Uruguay	4,929	4,275	5,163	61,443	135,065
Other countries	320,884	205,589	1,004,508	1,459,292	1,167,260
Total coal	2,252,608	2,122,767	16,966,965	13,964,837	15,016,314
Coke	673,372	651,788	5,763,584	5,711,948	5,678,815
Bunker coal	28,510	59,395	662,863	485,171	573,084

LAKE SHIPMENTS

Anthracite shipments through the Sault Ste. Marie Canal for November amounted to 233,708 tons, and bituminous was 1,343,248.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

1598—New Orleans, La.—Bids have been received on this contract (pp. 736, 957), which provides for furnishing the Public Belt Railroad Commission with approximately 8,000 tons of coal, as follows:

Company	Coal	Price per Ton
W. G. Coyle & Co.	Sipsey egg	$3.15
W. G. Coyle & Co.	Sipsey washed nut	2.85
West Kentucky Coal Co.	Mine-run	2.57½
Warrior Black Creek Co.	Screened lump	3.05
Warrior Black Creek Co.	Washed pea and slack	2.75
Andrews Coal Co.	Engine lump[1]	2.50
Robt. P. Hyams Coal Co.	Pratt	2.72
Robt. P. Hyams Coal Co.	Pratt mine-run[2]	2.93
J. W. Allen & Co.	Majestic[3]	2.90
Mabel Mining Co.	Mine-run	2.75
Tenn. Coal, Iron & R.R. Co.	Washed steam nut	2.90
Rodin Coal Co.	6-in. washed[4]	2.85
Rodin Coal Co.	4-in. washed[4]	2.75
New Orleans Coal Co.	Pratt[4]	2.70
New Orleans Coal Co.	Washed nut and slack	2.60
Corona Coal and Iron Co.	No. 2 lump	2.65
Corona Coal and Iron Co.	Locomotive nut	2.60
El Dorado Coal Co.	Pratt[4]	2.55

[1]Jagger Creek. [2]From Dixiana, Ala. [3]Black Creek washed. [4]Mine-run.

Address Secy. F. H. Joubert, Public Belt Railroad Com., Municipal Bldg., New Orleans, La.

1603—Krumroy Station, Ohio—Awards on this contract (p. 737), which provides for furnishing the Springfield Lake Sanitorium with approximately 15,000 tons of coal, will not be made until Jan. 1. Address Secy. F. L. Allen, Bd. of Trustees, Springfield Lake Sanitorium, Canton, Ohio.

1622—Spokane, Wash.—There were only two bids submitted on this contract (p. 787), which provides for furnishing the City Government with coal. The Diamond Ice and Fuel Co. bid $4.75 per ton for Carbondale slack and $5.45 per ton for mine-run, while the Crows Nest Pass Co. bid $4.80 on slack and $5.35 for mine-run. The contract involves approximately 600 tons for use at the various city institutions. It is understood that there is considerable controversy over the contract, and no award has as yet been made. Address Purchasing Agent, City of Spokane, Spokane, Wash.

1677—Chicago, Ill.—No awards have as yet been made on this contract (p. 912), which provides for furnishing the City Pumping Station with coal during the ensuing year, and it is now understood that the city will continue taking coal on the old contract for the next three months, provision for such an extension being embodied in that agreement. Address Comr. of Pub. Works L. E. McGann, Room 406, City Hall, Chicago, Ill.

1718—Robesonia, Penn.—The distribution of requirements on this contract (p. 998), which covers the purchases of the Robesonia Iron Co., are as follows, per annum: At the Robesonia, 2,400 tons of bituminous, 1,500 tons of anthracite and 60,000 tons of furnace coke; at Miners Village, 2,400 tons of bituminous. Address Supt. S. B. Patterson, Robesonia, Penn.

New Business

Volume and page number in parentheses at the end of an item indicate where the previous announcement, bids and awards on that contract may be found.

1747—New York, N. Y.—Bids will be received until 2 p.m. Dec. 20, for furnishing and delivering approximately 3,000,000 lb. of buckwheat No. 2, and 500,000 lb. of egg coal alongside of dock at the Asphalt Plant between 90th and 91st St. and East River. The contract is to expire on Apr. 1. Address Commissioner of Public Works, Room 2032, Municipal Bldg., New York, N. Y. (No. 605, Vol. 7, pp. 795, 918.)

1748—Mansfield, Ohio—The Mansfield Sheet and Tin Plate Co. is in the market for its annual fuel requirements, involving approximately 30,000 tons of Ohio ¾-in. steam coal. Deliveries are made by B. & O. R.R. Address Pres. W. H. Davey, the Mansfield Sheet and Tin Plate Co., Mansfield, Ohio.

1749—Mt. Vernon, Ill.—The Citizens Gas, Electric and Heating Co. is receiving bids for furnishing its fuel requirements, involving from 400 to 500 tons of 3-in. screening per month. Address Pur. Agt., H. A. Lomire, The Citizens Gas, Electric and Heating Co., Mt. Vernon, Ill.

1750—Urbana, Ohio—The United Paper Board Co. is receiving bids for a prompt shipment of 15 cars of nut and slack coal. Address Cashier R. R. Owen, United Paper Board Co., Urbana, Ohio.

1751—Chelsea, Mass.—The Revere Rubber Co. at this place usually contracts for its annual fuel requirements involving approximately 15,000 tons of New River mine-run coal in February. Deliveries are made by wagon at the rate of approximately 50 tons per day and the coal is bought under a guarantee of 14,500 b.t.u. The company has a storage capacity for 2,200 tons. Address Mgr. E. H. Scribner, Revere Rubber Co., Eastern Ave., Chelsea, Mass.

1752—Kalamazoo, Mich.—Chase & Woodruff are in the market for between 1,200 and 1,500 tons of West Virginia splint, nut and slack coal for prompt delivery. Address Pur. Agt. E. W. Chase, Chase & Woodruff, Kalamazoo, Mich.

1753—Lisbon, Ohio—The Board of Public Affairs will receive bids until 7 p.m. Dec. 15, for furnishing coal as may be required for the local Water-Works during the ensuing year. Bids were requested on mine-run, slack, and nut from Nos. 3 and 6 and from Pittsburgh vein coal. Quotations should be made f.o.b. switch at the Water-Works plant and a certified check for $50 must accompany each bid. Address Clk. W. E. Ferrall, Bd. of Pub. Affairs, Lisbon, Ohio.

1754—Philadelphia, Penn.—The Vulcanite Portland Cement Co. usually contracts for its annual fuel requirements involving between 25,000 and 50,000 tons of mine-run steam coal, and 50,000 to 75,000 tons of gas slack some time in January. The company has a storage capacity for 10,000 tons and deliveries are made by railroad. Address Purchasing Agent, Vulcanite Portland Cement Co., Land Title Bldg., Philadelphia, Penn.

1755—St. Louis, Mo.—The United States Engineering Department will receive bids until 11 a.m. Dec. 29, for furnishing the department with approximately 30,000 tons of coal during the ensuing year. Complete information may be had on application. Address United States Engineer Office, Custom House, St. Louis, Mo. (No. 26, Vol. 6, p. 972.)

1756—Delphos, Ohio—The Delphos Gas Co. is receiving bids on its annual fuel contract involving approximately 600 tons of ¾-in. gas lump or egg coal. Address Pur. Agt. W. M. Moran, the Delphos Gas Co., Delphos, Ohio.

1757—Hattiesburg, Miss.—The Hattiesburg Trading Co. usually contracts for its annual fuel requirements involving approximately 6,000 tons of Kentucky pea and slack and 1,200 tons of No. 2 lump gas coal some time in January. Deliveries are made by rail at the rate of about 600 tons per month and the company has a storage capacity for 800 tons. Address Pur. Agt. H. F. Wheeler, Hattiesburg Trading Co., Hattiesburg, Miss.

1758—Hanover, Ont., Can.—The Hanover Portland Cement Co., Ltd., usually contracts for its annual fuel requirements involving from 12,000 to 15,000 tons of slack, 500 to 1,000 tons of three-quarter lump and 1,000 tons of nut and slack coal some time in January. Deliveries are made by G. T. R.R. via bridge at the rate of about 300 tons per week. Address Pur. Agt. E. D. Greutzner, Hanover Portland Cement Co., Ltd., Hanover, Ont., Can.

1759—Mt. Vernon, Ill.—The Mt. Vernon Car Manufacturing Co. is in the market for its annual fuel requirements comprising screenings and mine-run coal. Address Pur. Agt. Webber, Mt. Vernon Car Manufacturnig Co., Mt. Vernon, Ill.

1760—Cambridge, Mass.—The Cambridge Gas Light Co. usually contracts for its annual fuel requirements some time in January. Mine-run bituminous coal is required. Address Purchasing Agent, Cambridge Gas Light Co., Cambridge, Mass.

1761—Van Wert, Ohio—Bids will be received until noon Dec. 18 for furnishing the local Water-Works Department

with coal as may be required during the ensuing year. Deliveries are to be made in carload lots in the bins at the pumping station. A certified check for $50 must accompany each bid and a satisfactory bond will be required from the successful bidder. Address Dir. W. T. Backus, Pub. Service, Van Wert, Ohio.

1762—Columbus, Ga.—Shepherd Brothers at this place usually contract for its annual fuel requirements involving from 5,000 to 6,000 tons of washed steam coal some time in February. The company has storage capacity for 12 cars and deliveries are made by railroad at the rate of about two cars per week. Address Purchasing Agent, Shepherd Brothers, Fifth St. and 10th Ave., Columbus, Ga.

1763—St. Louis, Mo.—The Hamilton Brown Shoe Co. is in the market for the fuel requirements at its Columbia factory, involving approximately 300 tons per month of 2-in. lump coal. Address Purchasing Agent, the Hamilton Brown Shoe Co., St. Louis, Mo.

1764—New York, N. Y.—Bids will be received until noon Dec. 21, for furnishing and delivering 170 tons of range coal as needed to County Clerk's Office and Court House, Richmond; Village Halls at Stapleton and New Brighton; Field Office at St. George and Coroner's Office, New Brighton, and Old Corn Exchange Bank Building, St. George; 565 tons of buckwheat No. 1 to Borough Hall, St. George, to be delivered in 150-ton lots. The range coal is to be delivered in 2- and 5-ton lots. The contract is to be completed during the year beginning Jan. 1. Address Pres. Calvin D. Van Name, Room 18, Borough Hall, New Brighton, Staten Island.

1765—New Orleans, La.—The G. H. Leidenheimer Baking Co. is now in the market for its annual fuel requirements, involving approximately 700 tons of coal. Address G. H. Leidenheimer, G. H. Leidenheimer Baking Co., 1500 S. Franklin St., New Orleans, La.

1766—Philadelphia, Penn.—The Link-Belt Co. is accepting tenders for its annual requirements of buckwheat and rice coal, involving approximately 1,500 tons. The contract becomes effective Jan. 1. Address Purchasing Agent, Link-Belt Co., Nicetown, Philadelphia, Penn.

1767—Camden, N. J.—The Southwark Manufacturing Co. is negotiating for its annual fuel supply, involving approximately 2,500 tons of pea coal. The contract is to run for one year from Jan. 1. Address Secretary Southwark Manufacturing Co., foot of Winslow St., Camden, N. J.

1768—New Orleans, La.—The Pelican Cold Storage and Warehouse Co. is in the market for its annual coal requirements, and will enter a contract shortly. Address Purchasing Agent, Pelican Cold Storage and Warehouse Co., 1561 St. Louis St., New Orleans, La.

1769—New Castle, Del.—The Baldt Steel Co. is in the market for its annual supply of broken coal, involving approximately 1,700 tons. Deliveries are to be made during the year beginning Jan. 1. Address Pur. Agt. G. A. Pederick, Baldt Steel Co., New Castle, Del.

1770—Philadelphia, Penn.—C. O. Struse & Sons, brick manufacturer is in the market for its annual supply of broken coal, involving approximately 2,000 tons, deliveries to be made during the year beginning Jan. 1. Address Purchasing Agent, C. O. Struse & Sons, Manayunk, Philadelphia, Penn.

1771—New Orleans, La.—The Ruddock-Orleans Cypress Co. is in the market for its annual fuel requirements, involving 50 to 60 cars of bituminous coal. Address Purchasing Agent, Ruddock-Orleans Cypress Co., Carrollton Ave. and New Basin, New Orleans, La.

1772—Warrensville, Ohio—The contract for furnishing the Correction Farm at this place, which is usually negotiated at about this time, is being delayed, due to plans that are under consideration for using gas when the current coal contract expires. It is understood on good authority that the administration at the farm will be changed Jan. 1, and in which event it is possible the new officials may reconsider this proposed change. Address Director of Public Welfare, City Hall, Cleveland, Ohio. (No. 57, Vol. 6, p. 189.)

1773—Cheltenham, Penn.—The Ames Shovel and Tool Co. is in the market for its annual supply of buckwheat coal, involving approximately 1,500 tons, to be delivered during the year beginning Jan. 1. Address Purchasing Agent, The Ames Shovel and Tool Co., Cheltenham, Penn.

1774—New Orleans, La.—The American Laundry Co. at this place will be in the market about Jan. 1, for their annual fuel requirements, involving approximately 25,000 tons. Address Pres. Chas. O'Connor, American Laundry Co., Julia and Magazine St., New Orleans, La.

1775—Chester, Penn.—The Crozier Home and Hospital will contract some time during the current month for its annual fuel supply, involving approximately 600 tons of anthracite pea coal. Address Secy. S. K. Ubill, Crozier Home and Hospital, Chester, Penn.

1776—New Orleans, La.—It is reported that the Union Brewing Co. at this place will negotiate its annual fuel contract some time before Jan. 1. Address Purchasing Agent, Union Brewing Co., 2809 N. Robertson St., New Orleans, La.

†1777—Pittsburgh, Penn.—Bids will be received until noon, Dec. 24, for furnishing the Western Penitentiary of Pennsylvania with coal as may be required at the Pittsburgh Prison, North Side, during the year beginning Jan. 1. Complete specifications and proposal forms may be obtained on application. Address Warden John Francis, Western Penitentiary, Pittsburgh, Penn. (No. 1,578, Vol. 8, p. 700.)

1778—Camden, N. J.—Bids will be received until 8 p.m., Dec. 22, for furnishing the local Water Department with approximately 4,500 gross tons of bituminous coal. All bids should be made f.o.b. cars, Morris Station, N. J., and analysis must accompany each proposal. The coal must be equal to Logan No. 1, or Thorne, Neale & Co.'s Sonman Shaft, South Fork, Miller Vein coal. Each proposal must be accompanied by a certified check for $300. Address Chn. Charles H. Greer, Water Com., Room 11, City Hall, Camden, N. J.

1779—Philadelphia, Penn.—Horrocks & Bro. will contract for their annual supply of buckwheat, involving approximately 3,500 tons, some time during the current month. Deliveries are to be made during the year beginning Jan. 1. Address Purchasing Agent, Horrocks & Bro., Frankford, Philadelphia, Penn.

1780—New Orleans, La.—It is understood that the New Orleans Brewing Co. will soon negotiate a contract for their annual coal supply. Address Purchasing Agent, New Orleans Brewing Co., Jackson and Tchoupitoulas St., New Orleans, La.

1781—Philadelphia, Penn.—The Arnholt & Schaefer Brewing Co. is receiving tenders for its annual fuel supply, involving approximately 2,000 tons of buckwheat and rice coal. Address Purchasing Agent, Arnholt & Schaefer Brewing Co., 31st and Thompson St., Philadelphia, Penn.

1782—New Orleans, La.—The Pelican Cracker Factory will contract for its annual fuel requirements, involving approximately 175 tons of bituminous coal and 50 tons of coke about Jan. 1. Address Pur. Agt. E. L. Gerde, Pelican Cracker Factory, 816 Magazine St., New Orleans, La.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

1428—Unionville, Mo.—The contract for furnishing the local Municipal Light and Water Works with coal during the year beginning Dec. 1 (p. 489), has been awarded to the **Iowa Block Coal Co.**, of Exline, Iowa, at $1.35 per ton in the bin at Unionville. The Thistle Coal Co., of Cincinnati, was the next bidder at $1.45 per ton. Address Supt. M. T. Lynn, Municipal Light and Water Works, Unionville, Mo.

1480—Massillon, Ohio—This contract (p. 576), which provides for furnishing the local Public Schools with coal as may be required during the ensuing year, has been awarded to the **Artificial Ice and Coal Co.**, on Goshen coal at the following prices, delivered: Lump, $2.28; mine-run, $1.99; slack, $1.65. Address Clk. Wm. Fielberth, Bd. of Education, Massillon, Ohio.

1534—Washington, D. C.—This contract (p. 616), which provides for furnishing the United States Senate with a small tonnage of anthracite coal, has been awarded to **W. H. Marlow & Co.**, on the following basis: Egg, $6.45; stove, $6.95; chestnut, $7.05. Address Sargeant-at-Arms Charles P. Higgins, U. S. Senate, Washington, D. C.

1601—Cameron, Mo.—This contract (p. 736), which provides for furnishing the local Municipal Light and Water Plant with approximately 3,000 tons of coal, has been awarded to **S. L. Evans** at $1.60 per ton for Novinger nut coal, and $2.20 for mine-run, f.o.b. Cameron. Kindig & Gage bid $1.30 for nut and $2.05 for mine-run. Address Clk. Clarence Staples, Cameron, Mo.

1611—Williston, N. D.—This contract (p. 786), which provides for furnishing coal as may be required at the local Court House and Jail during the ensuing year, has been awarded to the **North Western Fuel Co.** on North Dakota lignite coal at $2.45 per ton. Address County Audr. M. H. Aaen, Williston, N. D.

1671—Grand Haven, Mich.—This contract (p. 912), which provides for furnishing the Eagle-Ottawa Leather Co. with approximately 4,000 tons of West Virginia mine-run coal for use at their Grand Haven and Whitehall plants, has been awarded to the **Wyatt Coal Co.** Address B. Peter, The Eagle-Ottawa Leather Co., Grand Haven, Mich.

1672—Madison, Ill.—This contract (p. 912), which provides for furnishing the fuel requirements of the Barber Asphalt

Paving Co., involving about 30 tons per day, has been awarded to the **Mt. Olive & Staunton Coal Co.** The contract expires on Apr. 1 next. Address Pur. Agt. White, Barber Asphalt Paving Co., Madison, Ill. (No. 494, Vol. 7, p. 665.)

1683—Bozeman, Mont—This contract (p. 912), which provides for furnishing the County Board of Commissioners with approximately 100 tons of coal, has been awarded to **J. C. McCarthy,** on Fromberg coal at $4.85 per ton. Other bids were: George Hoover, Bear Creek, $5.35; Kooi, $4.90; Kenyon-Noble Lumber Co., Red Lodge or Bear Creek, $5.25; Fransham Coal Co., $5. Address Clk. E. H. Schumacher, Gallatin County, Bozeman, Mont.

1688—San Antonio, Tex.—This contract (p. 957), which provides for furnishing the St. Anthony Hotel with approximately 40 tons of lignite coal per month, has been awarded to the **Phelon Coal Co.** at $1.75 per ton for lignite coal, delivered in the bins. Address Ch. Engr. Orr, St. Anthony Hotel, San Antonio, Tex.

1699—Columbus Grove, Ohio—This contract (p. 958), which provides for furnishing the Columbus Grove Water-Works with approximately 2,000 tons of coal during the year, beginning Dec. 1, was awarded to the **Sauters Coal Co.** on its Pittsburgh No. 8 Gaylord three-quarter lump coal at $1.10 per ton, f.o.b. mines. Address Clerk Board of Public Works, Columbus, Ohio

1707—Jefferson, Wis.—This contract (p. 958), which provides for furnishing the local Board of Education with approximately 150 tons of West Virginia splint, dock screened coal, to be delivered at the High School and Public Library, has been awarded to the **N. J. Braun Lumber Co.** at $4.50. George Traeger bid $4.49, Fernholy Lumber Co. $4.70, and the Jefferson Brick and Tile Co., $4.80. Address Chn. S. E. Waterbury, Bd. of Edu., Jefferson, Wis.

1710—Cleveland, Ohio—This contract (p. 958), involving a prompt purchase of 200 cars of nut and slack coal, was awarded to the **Bertha Coal Co.** of Pittsburgh, on Pittsburgh coal at $1.95 per ton, f.o.b. Cleveland, Ohio. There were 20 other bidders on this business. Address T. P. Jones, Fuel Agent, Cleveland, Ohio.

1728—Cambridge, Mass.—This contract (p. 999), which provides for furnishing the Cambridge Water Board with approximately 1,000 long tons of coal during the next six months, has been awarded to Coleman Bros. at $4.85 per ton. Address Gen. Supt. Edward W. Quinn, Cambridge Water Works, Cambridge, Mass.

Contract Notes

East St. Louis, Ill.—The Fred Callaghan Coal Co. has contracted with the **Lumaghi Coal Co.** for 200 tons per month of "Cantine" 6-in. lump.

St. Louis, Mo.—The Avery Coal and Mining Co. has concluded a contract to market the output of the Mulberry Hill mine in the Belleville district.

St. Louis, Mo.—The Breese Trenton Coal and Mining Co. has sub-let a portion of its contract with the Terminal Railroad Association to the Kolb Coal Co.

East Indies—An American consular officer in this district reports shortage of coal, and submits the names and addresses of a number of local consumers.

Danielson, Conn.—The Danielson & Plainfield Gas and Electric Co. consumes about 4,000 tons of bituminous coal per annum, which costs approximately $4.25 per ton.

St. Louis, Mo.—The Heinecke Coal Co. has contracted with the **Consolidated Coal Co.** for approximately 600 tons per month of Mt. Olive lump coal, contract to expire Apr. 1.

Madison, Ill.—The Kettle River Co. has contracted with the **Kolb Coal Co.** for approximately 600 tons of "Mascoutah" 2-in. lump coal per month. Address Pur. Agt. H. Gilliam, The Kettle River Co., Madison, Ill.

Madison, Ill.—Kosta & Co. have contracted with the **Heinecke Coal Co.** to cover their requirements until Apr. 1. They will take about 400 tons per month of Worden lump coal. Address Pur. Agt. Kosta, Kosta & Co., Madison, Ill.

Delphos, Ohio—The Delphos Electric Co. is understood to have closed its contract, involving approximately 1,500 tons of West Virginia mine-run at 65c. at the mines. Address Supt. C. K. Beilharz, The Delphos Electric Co., Delphos, Ohio.

Fall River, Mass.—The Arkwright Mills at this place consume approximately 6,000 tons of Pocahontas coal which is delivered by wagon. The company does not contract. Address Treas. Herbert H. Marble, The Arkwright Mills, Fall River, Mass.

St. Louis, Mo.—The Crunden-Martin Woodenware Co. has contracted with the **Peabody Coal Co.** for approximately 200 tons of Hillsboro 2-in. lump coal per month. Address Pur. Agt. Wm. M. Crunden, The Crunden-Martin Woodenware Co., St. Louis, Mo.

Granite City, Ill.—The Granite City Lime and Cement Co. has contracted with the **Lumaghi Coal Co.** for approximately 600 tons of "Cantine" 6-in. lump coal per month. Address Pres. C. W. Eisenmayer, The Granite City Lime and Cement Co., Granite City, Ill.

Bessemer City, N. C.—The Atlas Mfg. Co. at this place consumes about 50 tons of mine-run coal per week. The company has storage capacity for five cars, and deliveries are made by railroad. Address Pur. Agt. A. A. McLean, Jr., Atlas Mfg. Co., Bessemer City, N. C.

New Orleans, La.—The No. 3 plant of the Dixie Ice Manufacturing Co. consumes about 450 tons of lump coal per month which is being bought in the open market at the present time. Address Chf. Engr. J. A. Lamar, The Dixie Ice Manufacturing Co., New Orleans, La.

St. Louis, Mo.—The City Coal Co. has awarded the **Lumaghi Coal Co.** a contract for approximately 1,600 tons per month of "Cantine" lump, and 800 tons of "Black Brier" lump, the contract to expire Apr. 1. Address Secy. and Pur. Agt., P. A. Riley, City Coal Co., St. Louis, Mo.

St. Louis, Mo.—The Union Seed and Fertilizer Co. will confine their purchases, involving approximately 500 tons of 1½-in. or 2-in. screenings per month to the open market during the balance of this season. Address Pur. Agt. McCullough, The Union Seed and Fertilizer Co., St. Louis, Mo.

St. Louis, Mo.—The contract for furnishing the National Utilization Co. with approximately 200 tons of 2-in. lump and 2-in. screened nut per month, has been awarded to the **Lumaghi Coal Co.** on their "Cantine" coal. Address Gen. Mgr. and Pur. Agt. P. A. Doyle, National Utilization Co., St. Louis, Mo.

St. Louis, Mo.—The contract from furnishing the St. Louis Basket and Box Co. with their annual fuel requirements, involving approximately 400 tons per month at both plants, has been awarded to the **Schroeter Coal Co.** on Breese 2-in. screened lump. Address Pur. Agt. Lehman, St. Louis Basket and Box Co., St. Louis, Mo.

St. Louis, Mo.—The John Reenan Coal Co. has placed a contract with the **Lumaghi Coal Co.** for furnishing 500 tons of "Cantine" 6-in. lump coal per month, and one with the Searles Coal Co. covering its requirements of McClintock lump and egg. Both contracts run until Apr. 1. Address John Reenan Coal Co., St. Louis, Mo.

Granite City, Ill.—The contract for furnishing the Draper Manufacturing Co., with approximately 80 tons of 2-in. screened nut coal per month, awarded to the **Lumaghi Coal Co.,** on their "Cantine" coal (p. 1000), was negotiated at $1.37½ per ton. Address Pres. and Pur. Agt. C. L. Draper, Draper Manufacturing Co., Granite City, Ill.

Louisville, Ky.—Louisville Ry. Co. contracts bi-yearly for their fuel requirements which in 1914 amounted to 116,436 tons of pea and slack coal. Deliveries are made by railroad at the rate of 300 tons per day. The company has bin-storage capacity for 1,800 tons, and practically unlimited capacity in the open. Address Supt. of Motive Power F. H. Miller, Louisville Ry. Co., 326 W. Jefferson St., Louisville, Ky.

Louisville, Ky.—The contract of the Central Coal and Iron Company (p. 1000), involving 1,000 to 1,200 tons of pea and slack coal and covering a period of five years, was awarded to the **Central Coal and Iron Co.** at $1.70 per ton. Other bids were requested on this business, but no other companies would undertake to bid on a contract covering this period. Address Pur. Agt. P. M. O'Reilly, Central Coal and Iron Co. 4th and Market St., Louisville, Ky.

Ensley, Ala.—Bids have been received on the contract for furnishing the Bessemer Fire Brick Co. with approximately 12,000 tons of mine-run coal per annum (p. 960) as follows: Pratt Consolidated Coal and Coke Co., $1.25; Sloss Sheffield Coal and Iron Co., $1.20; Eldorado Coal Mining Co. $1.15; Yolanda Coal and Coke Co. (this bid on nut coal) $1.40. No award has apparently been made. Address Pur. Agt. J. W. Minor, Bessemer Fire Brick Co., Ensley, Ala.

Indianapolis, Ind.—The contract for furnishing the County Infirmary with approximately 1,600 tons of Greene County, No. 4 coal, has been awarded to the **Globe Coal Co.** at $1.84 per ton. This company also received further awards on this business as follows: 50 tons of Hocking Valley $2.95; 50 tons of Ohio Jackson $3.65; 700 tons for the Workhouse on Greene County No. 4 at $1.79; 1,500 tons for Marion County Asylum at Julietta, Green County No. 4 $2.09. **A. B. Meyer & Co.** obtained the contract for the Detention Home at $4.90 per ton for 75 tons of Pocahontas and $5.65 per ton for 10 tons of coke. Address County Infirmary, Indianapolis, Ind.

Financial Department

Geo. B. Newton Coal Co., Philadelphia

Pres. Samuel B. Crowell reports in substance for the half year ended Apr. 30, 1915:

The net quick assets on Apr. 30, 1915 aggregated $613.030 and the net assets $2,113,113; deducting $61,250 for the dividend declared Apr. 26, 1915, on the first pref. stock, and $17,500 for sinking fund, the actual net quick assets on said date were $534,280. While the said net quick assets are still below the sum of $600,000 contemplated by the by-laws, they show an increase of $97,169 over the corresponding item on Oct. 31, 1914. The total net assets show an increase of $31,476 over Oct. 31, 1914.

Exclusive of the first pref. stock about to be acquired with the $20,885 now available, the company has since organization acquired $94,700 of first pref. stock, which is held in the sinking fund, and the dividends on which will be added to the sinking fund.

In view of the general business depression existing during the last six months, particularly in the manufacturing districts, we consider that the company's showing for the period in question is good.

BALANCE SHEET (INCL. B. ROWLAND & BRO., INC.)

Assets	Apr. 30, 1915 $	Oct. 31, 1914 $	Liabilities	Apr. 30, 1915 $	Oct. 31, 1914 $
Real est., bld's., etc.,a	1,747,615	1,756,367	First pref. stock	1,750,000	1,750,000
Good will	2,345,250	2,345,250	Second pref. stock	1,710,000	1,710,000
Trade agreements	822,300	822,300	Common stock	1,750,000	1,750,000
Investments	16,840	16,178	Funded debt	242,000	242,000
Sinking funds	79,845	54,614	Bills payable	205,000	316,428
Cash	187,239	151,264	Accounts payable	525,186	585,076
Bills and accounts receiv	719,748	734,113	Accrued charges	18,923	8,704
Coal and wood	436,230	531,989	Reserves	56,665	15,570
Miscellaneous	108,894	116,126	Surplus	b206,187	150,423
Total	6,463,961	6,528,201	Total	6,463,961	6,528,201

a Includes April 30, 1915, real estate, $712,411; buildings and improvements, $425,333; machinery, tools and scales, $142,719; horses, wagons and harness, $431,993; and furniture and fixtures, $35,159. b Includes April 30, 1915, special surplus (sinking fund), $74,445; provision for 1st pref. dividend, $61,250; provision for sinking fund, $17,500, and undistributed profits, $52,992.

Lehigh Valley Coal Co.

This company reports for the fiscal year ending June 30, 1915, as follows:

Results—The conditions in the anthracite trade have not been very satisfactory because of the mild weather which has prevailed during the past several winters. While the tonnage mined shows a slight increase over the preceding year, all of the increase was made in the first six months. The second half of the year shows a decrease as compared with the same period a year ago. Our total net income from all sources, after deducting charges for royalties, sinking funds, depreciation and interest on funded debt, amounted to $1,022,815, an increase of $457,955.

Coal Output—The production of anthracite coal from the lands owned and leased by Lehigh Valley Coal Co., including that mined by tenants, was 8,088,901 gross tons, an increase of 211,511 tons. The percentage of sizes above pea produced by the mining operations of the company was 65.41%, a decrease of 1.05%. The bituminous coal mined from the Snow Shoe lands, located in Centre County, Penn., amounted to 258,205 gross tons, an increase of 5,474 tons.

Additions, Etc.—The property was fully maintained and $517,542 was expended for additions and betterments. The steel fireproof breaker at Packer No. 5 colliery was completed and is now in successful operation. At Packer No. 4 colliery the alterations to the breaker and the concentration of the underground pumping are well under way. To reduce still further danger by fire, a complete spray system was introduced at each of the frame breakers, effecting a substantial reduction in the premiums paid for fire insurance.

Prospecting on the Broadwell lands in Lackawanna County is now in progress with a view to commencing mining operations thereon and taking the coal to Heidelberg colliery for preparation.

The operations on the bituminous coal lands at Snow Shoe are being steadily developed to permit of greater efficiency. As soon as the power line, now under construction, is completed, electric haulage will be substituted for mules and electric coal cutting machinery will be introduced in place of pick mining.

The properties at West Harrison St., Chicago, and Fillmore Ave., Buffalo, were sold during the year.

Suit—Included in the cash on hand is the sum of $678,085, representing an amount set aside on account of the special Pennsylvania tax of 2½% of the value of the coal mined. The constitutionality of this law has not as yet been decided by the courts.

Sinking Funds, Etc.—By the sinking fund, $404,000 Delano Land Co. first mortgage 5% bonds were purchased and canceled, reducing the fixed charges by $20,200 a year. "Deferred real estate payments," representing short-term notes given for property in prior years, have been reduced by $100,000. Payments amounting to $112,804 were made to the sinking funds of our various mortgages.

Current Assets—These are $3,521,901 in excess of current liabilities.

Note—For previous annual report of this company see Vol. 6, p. 1010.

Byproduct Coke Corporation

(Eighth Annual Report—Year ending Dec. 31, 1914.)

INCOME ACCOUNT FOR CALENDAR YEARS

	1914	1913	1912	1911
Total earns. from oper	$472,480	$851,089	$790,526	$479,746
Premium on bonds	.....	.....	6,500	.....
Earns. from investments	36,863	18,270	12,180	.....
Total earnings	$509,343	$869,359	$809,206	$479,746
Expenses and taxes	68,467	61,726	51,452	49,009
Bond. etc., interest	108,399	146,108	80,058	61,508
Depreciation, etc	153,758	316,408	262,092	186,151
Dividends	(4%) 155,864	(6%) 180,000	(8%) 240,000	(6%) 180,000
Balance for year	$22,856	$165,117	$175,604	$3,078

BALANCE SHEET DEC. 31

Assets	1914	1913	Liabilities	1914	1913
Plant account	$3,954,783	$3,867,615	Capital stock	$3,896,600	$3,000,000
Real estate	462,694	462,694	Stock scrip	.....	891,100
Invest's in other cos	607,903	561,594	Bonds	2,000,000	2,000,000
Sinking fund	287,267	208,061	Bills payable	250,000	400,000
Cash	304,357	250,488	Accrued bond int'r't	22,034	22,202
Material and supplies	771,111	1,172,801	Wages	20,339	39,316
Accounts receivable	331,950	367,525	Miscellaneous	33,886	21,207
Miscellaneous	18,741	10,978	Accounts pyable	65,612	81,206
			Undivided earnings	*450,335	446,725
Total	6,738,806	6,901,756	Total	$6,738,806	$6,901,756

* From the undivided earnings as shown above, $450,335, there was deducted $6,580 for bonus to employees, leaving a balance to be carried forward of $404,788.

New England Gas & Coke Co.—Mild weather and poor general business so affected the market for coke that sales of coke and the profits therefrom fell off materially during the year ended June 30. As a result the company paid a dividend of only 3½% for the year as against a dividend of 4½% in 1913-14. The new coal-crushing plant was completed and put in operation. There was also put in operation a new modern coke-crusher.

New England Coal & Coke Co.—During the year ended June 30, 1915, the company sold and delivered approximately 3,424,000 gross tons of coal, an increase of some 651,000 gross tons over the previous year. The Coke Co. paid during the year a dividend of 10% and an extra dividend of 10% on its capital stock. [In 1913-14 paid 10% and 30% extra.] The usual liberal allowances were made for depreciation.

The New England coal market in the year ending June 30, 1915, was far from satisfactory, due to the continuation of poor conditions of general business. Water freights, however, since August 1, 1915, coastwise and particularly off shore, have shown considerable advance due to the war. The company has been able to charter one of its steamers constantly and another steamer intermittently since Jan., 1915, thus securing a share of the high off-shore freights.

During the year the company purchased the ocean-going fleet of the Commercial Tow Boat Co., consisting of two tugs and nine barges. It also purchased the steamers Arlington and Brandon, each of 3,000 gross tons cargo capacity, and has had them altered for the coastwise coal trade. They are now in service between Hampton Roads and New England ports.

During the year arrangements were consummated with the New River Coal Co., whereby this company is assured for a term of years a large supply of high-grade New River coal for shipment to the New England market.